DOCUMENT RESUME

ED 147 582 CE 014 022

AUTHOR	Lawson, Jane; And Others
TITLE	Travel On! Mini-Units and Learning Activities on Transportation for Grades 4-6.
INSTITUTION	Abt Associates, Inc. Cambridge, Mass.
SPONS AGENCY	Office of Consumer Affairs, Washington, D.C.
PUB DATE	77
CONTRACT	DOT-OS-30086; DOT-OS-50026
NOTE	456p.; For related documents see CE 014 021-032
EDRS PRICE	MF-$0.83 HC-$24.77 Plus Postage.
DESCRIPTORS	Basic Skills; Curriculum Guides; Elementary Education; Elementary School Curriculum; Energy Conservation; Environmental Education; Group Activities; Independent Study; Intermediate Grades; *Learning Activities; Lesson Plans; Motor Vehicles; Pedestrian Traffic; Pollution; Resource Materials; *Safety Education; Service Vehicles; Skill Development; Traffic Regulations; *Traffic Safety; Traffic Signs; *Transportation; *Vehicular Traffic

ABSTRACT

One of a series of eleven curriculum manuals which cover the four transportation topics of public transportation, transportation and the environment, transportation safety, and bicycles for elementary, secondary, and adult levels, this manual for grades 4-6 covers all four topics. Materials in four chapters comprising fourteen mini-units cover different aspects of each of the four topics. Each mini-unit consists of a lesson plan component, which provides a suggested sequence of learning activities, and an individual learning activities component, which describes in detail how to implement each exercise. Typical elementary mini-units focus on street signs, emergency vehicles, learning to ride a bike, and an introduction to the concepts of pollution and energy conservation. Most units provide opportunity to exercise basic skills in language arts, mathematics, and social interaction. Supplementary activities are included at the end of each chapter which offer additional learning activities for independent use. Also included are readings on transportation and the environment, a list of references for further study resources, and masters for reproduction of role profiles, game boards, maps, and other distributable materials. (A curriculum guide, CE 014 028, is also available for use with the manuals.) (TA)

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TRAVEL ON!

MINI-UNITS AND LEARNING ACTIVITIES ON TRANSPORTATION

for

grades 4-6

by

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U S DEPARTMENT OF HEALTH,
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Abt Publications
1977

CE 014 022

This Manual is one of a series prepared by Abt Associates Inc., 55 Wheeler Street, Cambridge, Massachusetts 02138, under two contracts (#DOT/OS/30086 and #DOT/OS/50026) with the Office of Consumer Affairs, U.S. Department of Transportation. The opinions, recommendations, and conclusions expressed in these publications are those of the authors and do not necessarily reflect the views or the policies of the Department of Transportation.

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FOREWORD

TEACHING TRANSPORTATION: AN OVERVIEW

> Nearly everything Americans do, from mailing a postcard to walking on the moon, depends on transportation. Transportation is essential for the supply of food, clothing and shelter, for national defense and employment, for education and recreation, for the international exchange of goods and services.*

While every American is provided with the necessities and amenities of modern life through an intricate freight-carrying network, we think of transportation most readily in terms of moving people, not products, and for good reason. Millions of us commute to work every day by car, bus, train, or subway. Moreover, 21 million youngsters travel on school buses every day. Americans use a variety of transportation modes for other purposes, including shopping, recreation, tourism, and moving. The average family changes residence once every five years and makes use of one of the many thousands of for-hire companies that provide domestic surface transportation. In addition, Americans travel more than 1.7 trillion miles by passenger cars or trucks every year, while AMTRAK's 250 trains cover 26,000 miles and service 484 communities with more than 7 million people annually using the New York to Washington run alone. There are also 950 intercity bus companies whose 20,600 vehicles travel 1.1 billion miles each year, while commercial aircraft transport over 210 million passengers annually.

Americans are highly dependent on transportation services for recreation purposes, too. Not only are vehicles used for transportation to places of entertainment, many vehicles are themselves forms of recreation. For example, there are approximately 7.3 million registered boats in the country, not counting rowboats and canoes. Seven and one-half million motor homes, truck campers, and travel and camping trailers are on the roads. Snowmobiles, dune buggies, and home-built vehicles have become widespread in the past few years.

Americans also relax on two-wheeled vehicles: there are 100 million bicycles and nearly five million motorcycles in the country, many of which are used for commuting as well as for recreation.

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*John Burby, *The Great American Motion Sickness*, Little, Brown and Co., (Boston: 1971), page 3.

The most frequently used form of transportation in the nation, however, is walking. We sometimes forget that pedestrians utilize the single most common mode of travel.

Finally, the overwhelming importance of transportation in our lives must be assessed not only in terms of movement of goods and people, but also in relation to the millions of jobs transportation provides. Transportation facilities and vehicles require manufacturers, builders, operators, and mechanics, while they also create thousands of employment opportunities in related industries, from foundries which produce steel for vehicles to insurance companies which provide automobile insurance to health care systems which treat travel-related injuries.

For all these reasons it is important for students to become aware of transportation as it affects their lives, to learn to be wise purchasers and users of transportation goods and services, and to develop skills to promote constructive use and appropriate expansion of all forms of transportation in their communities and beyond.

In particular, consumers should become informed about (1) improving and using public transportation, (2) harmonizing transportation and the environment, (3) understanding transportation safety, and (4) appreciating the importance of bicycling. By examining these four major topics, students will learn, for example: to identify the best methods for commuting to school and work; to travel, when possible, in ways which minimize adverse transportation effects on the environment; and to purchase and use transportation vehicles and facilities in the safest possible manner.

CURRICULUM MATERIALS AVAILABLE

This Manual is one in a series of volumes which treat at different grade levels the four transportation topics of Public Transportation, Transportation and the Environment, Transportation Safety, and Bicycles. These volumes were developed by Abt Associates Inc. under contract to the U.S. Department of Transportation, Office of Consumer Affairs. The following eleven Manuals and curriculum guide on transportation consumer education are currently available:

- TRAVEL ON! Mini-units and Learning Activities on Transportation for Grades K-3 (Safety, Bicycles, Environment, Mass Transit)
- TRAVEL ON! Mini-units and Learning Activities on Transportation for Grades 4-6 (Safety, Bicycles, Environment, Mass Transit)
- Transportation Consumer Education for Adults: Mini-units and Learning Activities (Safety, Bicycles, Environment, Mass Transit)
- PEDAL ON! Mini-units and Learning Activities on Bicycling for Grades 6-9
- PEDAL ON! Mini-units and Learning Activities on Bicycling for Grades 9-12
- RIDE ON! Mini-units and Learning Activities on Public Transportation for Grades 6-9
- RIDE ON! Mini-units and Learning Activities on Public Transportation for Grades 9-12
- GETTING THERE! Mini-units and Learning Activities on Transportation Safety for Grades 6-9
- GETTING THERE! Mini-units and Learning Activities on Transportation Safety for Grades 9-12
- Transportation and the Environment in Harmony: Mini-units and Learning Activities for Grades 6-9
- Transportation and the Environment in Harmony: Mini-units and Learning Activities for Grades 9-12
- Transportation Consumer Education: A Curriculum Guide for Grades K-12 and Adult

These volumes may be ordered from:

Abt Publications
55 Wheeler Street
Cambridge, Massachusetts 02138

ACKNOWLEDGMENTS

This particular Manual has been reviewed in part or whole by a broad range of people. Several individuals also supplied the authors with useful resource documents. We are grateful for these comments and materials, many of which were incorporated in the final version.

Staff of the following agencies within the Federal government reviewed some or all of the Manual.

The Federal Aviation Administration (FAA)

The Federal Highway Administration (FHWA)

The Federal Railway Administration (FRA)

The National Highway Traffic Safety Administration (NHTSA)

The Office of Education, Bureau of Occupational Education (OE/BOE)

The Office of Education, Division of Technology and Environmental Education

The United States Coast Guard

The Urban Mass Transportation Administration (UMTA)

Many individuals within these agencies were very helpful in pointing out biases in the materials, errors of fact, and pedagogical weaknesses.

Thanks are given to Donald Bockler for designing several science experiments; to Linda Abrams for her maticulous review of the many, many drafts; and to Bertha King, U.S. Office of Education, and Ruth Rodman, consumer education consultant to the contract, for their careful review of the curriculum in its many stages.

We are also grateful to the following teachers for field testing various portions of the Manual in their classrooms and with their students.

Bicycles and Bicycle Safety

Valerie Bailey, Champlain Elementary School, Boston, Massachusetts

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Transportation and the Environment

Rosemary Caratelli, Fulton School, Medford, Massachusetts
Marie Williams, Fulton School, Medford, Massachusetts

Special mention must be made of a curriculum guide which we used extensively for ideas and activities on bicycles. This is the Maryland State Department of Education *Teacher's Guide for Bike Basics*. We are grateful to Donald Lafond for allowing us to adapt several activities from this creative document.

We should make clear that none of the agencies or individuals cited above is in any way responsible for errors or biases in the final products.

Antonina Uccello, Director of the Office of Consumer Affairs in the Department of Transportation, who was responsible for this project, actively and very helpfully involved herself in it from beginning to end. Finally, we are happy to allocate a large share of the credit for the Manual to the constant availability, assistance, and suggestions of the two Contract Technical Monitors for the project, Lee Learner Gray and Marilee Cavender.

The complex and time-consuming tasks of typing, proofing, and preparing the manuscript for publication were coordinated by Judy Sobel with complete competence and exemplary patience.

INTRODUCTION

WHAT'S IN THE MANUAL

This Manual is divided into four chapters, each one treating a different topic. The four chapters focus on

1. Bicycles and Bicycle Safety
2. Transportation Safety
3. Public Transportation
4. Transportation and the Environment

Within each chapter are *mini-units* which present different aspects of the chapter topic.

Each mini-unit consists of two components:

1. *A lesson plan* which provides a suggested sequence of learning activities, and
2. *Individual learning activities* which describe in detail how to implement the exercises in the lesson plan

The learning activities are designed to

- Supply detailed teaching instructions which promote maximum flexibility and adaptability
- Involve students in action-oriented exercises, such as role plays, field trips, polls, and small group discussions
- Treat affective and attitudinal issues involved in decision-making and behavior, as well as promote skills for safe travel

At the end of each chapter is a section called Supplementary Activities. In some chapters, this section offers additional learning activities that may be used independently. Other chapters contain a quiz that may be used to evaluate or supplement your evaluation of an activity or an entire mini-unit.

Also included at the end of each chapter is a bibliography of suggested teacher and student materials.

Fourteen spirit masters are provided at the end of the Manual for use with specific activities.

HOW TO USE THE MANUAL

This Manual is designed as a resource volume of activities and background materials to be used in ways which are compatible with your needs and those of your students.

The mini-units and individual learning activities may be integrated into your curriculum at many points and to meet many purposes:

- In *social studies*, the activities enhance knowledge of one's community. They aid in understanding the importance of citizen participation in government, and they broaden the study of transportation itself.

- In *science*, the activities discuss the impact that transportation has on the environment.

- *Health and safety units*, as well as physical education classes, can benefit from the Manual's emphasis on learning skills for safe travel behavior.

- *Language arts* skills are integral to all the mini-units, since the activities are designed to develop and reinforce students' capacities to listen, speak, write, observe, and analyze.

You will find that the introduction to each chapter sums up the reason for teaching that topic in your classroom. After reading these four introductions, you will have the background to decide which chapter or chapters you will teach. In examining the mini-units in a given chapter, you should feel free to make substitutions or deletions in the mini-units and in the learning activities whenever that is desirable to meet your teaching objectives.*

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*Some activities which involve comparisons between different modes of transportation (for example, buses vs. subways, cars vs. buses) may appear usable only in communities in which there are other forms of transportation besides the automobile. However, students in such communities can still conduct most of these activities by imagining that their town has at least two modes of transportation or by conducting the activity as if they live in a community which provides several transportation modes.

Students need to study different transportation modes even if their own communities fail to provide more than one or two because a general knowledge of every aspect of transportation is important to all citizens in a highly technological and mobile society such as ours. On a more practical level, students may be able to benefit concretely from a study of different transportation modes if they someday move to communities where several modes are available.

Here are several methods for adapting the mini-units and learning activities to teach transportation in your classroom.

1. You can read through the lesson plans for each mini-unit in a particular chapter and *select one or more mini-units* to integrate into your curriculum. Having made your selection, read the detailed activity descriptions which follow the lesson plans for specific instructions on implementing the activities in the mini-unit or units you have chosen.

   This method of using the Manual is most appropriate if you wish to concentrate in some depth on one or more specific aspects of transportation.

2. You can also *develop your own mini-unit* consisting of activities that you select from several mini-units. If you wish to do this, read the capsule descriptions of each activity that appear on the chart on the first page of each chapter. This chart will show you, at a glance, all mini-units and activities offered in each chapter. The activities are numbered consecutively throughout the Manual from 1 to 61 regardless of chapter topic. Likewise, the mini-units are numbered consecutively from 1 to 14.

3. You can extract one or more of the individual activities from the Manual and *integrate them at appropriate points into your existing curriculum.*

4. You can *implement one or more of the activities on an informal basis* in response to concerns or interests your students express spontaneously about various transportation topics.

BICYCLES

WHY TEACH ABOUT BICYCLES AND BICYCLE SAFETY

The Problems

The use of bicycles by people of all ages has increased tremendously in the United States. Bicycle sales reached 14.1 million in 1974. In that year more bicycles were purchased than automobiles. There are 100 million bicycles currently in use. It is expected that half the nation's population will be bicycle riders by 1980.

The greater number of bicycles has increased the need to educate people about bicycle safety. In 1974 the Consumer Product Safety Commission singled out bicycles as the most hazardous product on the American market. The Commission estimated that bicycles and the equipment associated with them are responsible for 460,000 injuries requiring emergency room treatment each year, the majority of which involve youngsters.

Three bicyclists are killed in accidents every day--or over 1,000 a year. There are also 1 million bicycle injuries annually, including 60,000 concussions and 120,000 fractures. Two-thirds of bicycle deaths and a high proportion of injuries involve children aged 5 to 14.

Bicycle safety education is important not only for its own sake, but also as a means of inculcating basic transportation safety principles at an early age in a relevant way. By the time youngsters secure their driver's license, many of their attitudes toward safety have become ingrained and future education and experiences can do little to alter them.

Most of the safety principles learned in connection with the bicycle can be transferred to use of other transportation modes, including walking, motorcycling, and automobile driving.

The increase in bicycle sales recorded over the last few years has been accompanied by rising public interest in better biking facilities. Many states and local communities are using public funds to finance bikeways and bicycle parking facilities. Better bicycle facilities in turn are creating interest in the bicycle as a viable and non-polluting, non-energy consuming form of urban transportation.

As bicycles have increased in demand and sophistication, bicycle thefts have become a major consumer problem.

Since there are now numerous types of bicycles available at a wide range of prices, financial considerations are increasingly important in the public mind. As equipment becomes more complex and expensive, maintenance and quality of repair work also become important issues for the consumer of any age.

The Solutions

Federal and state governments must promote balanced transportation by providing assistance for planning, developing, and financing of improved bicycle facilities; it must enact legislation which would be of assistance to bicyclists; and establish bicycle manufacturing and bicycle riding safety standards and regulations. Local governments should provide adequate and safe bicycle facilities and implement programs to curtail bicycle theft.

Citizens/consumers should become informed about bicycle safety laws and regulations and practice safe bicycling habits. They should be informed about problems associated with bicycle purchase, maintenance and use and participate in their solution.

Teachers can guide students to a better understanding of the importance of bicycle safety and the availability of adequate bicycling facilities. Classroom education and transportation consumer education can offer the student a unique opportunity to develop awareness and skills essential to acquire responsible bicycling habits and to play a role in promoting responsible family and community attitudes toward bicycling.

This chapter focuses on developing consumer skills that are particularly appropriate from grades 4-6. The learning activities are designed to

- Promote awareness of the variety of uses to which bicycles can be put; recreational, shopping, visiting, commuting, and running errands
- Develop an awareness of and a positive attitude toward safe bicycling practices
- Stimulate concern for other people who ride their bicycles dangerously
- Develop wise purchasing skills
- Motivate students to maintain their bicycles in safe operating condition and provide them with the necessary information to do so

BICYCLES AND BICYCLE SAFETY

Mini-unit 1

Learning about bicycles and how they are used

Activity #	*Activity Description*	*Class Time*[a] *(periods)*
1	Students discuss the advantages and disadvantages of bicycling.	2-3
2	Students obtain maps of their community and plot usable bicycle trails for recreational and commuting transportation.	1½-2
3	The class discusses recreational bicycle activities cyclists can organize and engage in.	1
4	Students create their own imaginary culture or country with its own distinctive attitudes toward use of and laws regulating bicycles.	1½-2
	Mini-unit 2 Learning about bicycle purchase and maintenance	
5	Students learn about purchasing a bicycle, then pretend they are bicycle advertisers and create their own advertisements.	2-3
6	Students role play scenes in which children try to persuade their parents to buy them a bicycle.	1-1½
7	Students discuss methods for preventing bicycle theft.	1½-2
8	Students learn about maintaining a bicycle and perform basic maintenance tasks on a bicycle.	1½-2

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[a] Assumes a class period of 30-40 minutes.

Mini-unit 3

Using your bicycle safely.

Activity #	*Activity Description*	*Class Time[a] (periods)*
9	Students learn about bicycle safety and distinguish safe from unsafe bike riding behavior.	1½-2
10	Students take a poll on their experiences with bicycles.	1
11	Students engage in one or more mini-activities designed to teach students to identify some of the emotional factors involved in riding a bicycle.	1½-1 per mini-activity
12	Students role play and discuss scenarios in which a person is about to ride unsafely or is being pressured to ride unsafely.	1-1½
13	Students engage in bicycle riding skill development activities that are designed to promote safe riding.	½-1 per exercise
	Supplementary Activities	
14	Students play a card game that requires them to distinguish between safe and unsafe bicycle riding.	1
15	Students engage in bicycle games and races.	½-1 per game or race
16	Students answer questions on bicycles and bicycle safety.	½-1

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[a] Assumes a class period of 30-40 minutes.

MINI-UNITS
AND
LEARNING ACTIVITIES

MINI-UNIT 1

LEARNING ABOUT BICYCLES AND HOW THEY ARE USED

Bicycles are used by different people for a variety of purposes, including enjoyment, exercise, shopping, socializing, and commuting to and from work and school. Students need to be familiar with the possible ways in which to use bicycles so that they may take full advantage of the varied opportunities bicycling presents. This unit is offered as an introduction because the way one plans to use a bicycle will influence the kind of bike one buys--a topic dealt with in more detail in Mini-unit 2, Learning About Bicycle Purchase and Maintenance. This unit also introduces the concept of bicycle safety--a topic discussed in depth in Mini-unit 3.

Students also need to be aware of the general advantages and disadvantages of biking so they may decide whether they wish to purchase a bike, what kind of bike to buy, and when and how to use one.

Key concepts addressed in this unit include the following:

- People have different views on what the advantages and disadvantages of owning and riding bicycles are.
- To be safe, convenient, and fun, bike routes must meet certain standards.
- For safety reasons, certain aspects of bicycle riding must be regulated.
- There are many different recreational uses for bicycles.

MINI-UNIT 1 LESSON PLAN

Learning about bicycles and how they are used

Activity #	*Activities*	*Class Time*
1 Spirit Master #1	DESCRIPTION: Students discuss the advantages and disadvantages of bicycling. OBJECTIVE: By the end of the activity students will be able to name three advantages and three disadvantages of owning and riding a bicycle.	2-3 periods
2	DESCRIPTION: Students obtain maps of their community and plot usable bicycle trails for recreational and commuter transportation. OBJECTIVE: By the end of the activity students will be able to identify suitable bike routes and explain why they are appropriate.	1½-2 periods
3	DESCRIPTION: The class discusses recreational bicycle activities cyclists can organize and engage in. OBJECTIVE: By the end of this activity, students will be able to defend, in writing or orally, reasons they would or would not want to participate in one or more recreational bicycle activities.	1 period
4	DESCRIPTION: Students create their own imaginary culture or country with its own distinctive attitudes toward use of and laws regulating bicycles. OBJECTIVE: By the end of the activity and the conclusion of the mini-unit, students will be able to name three uses of bicycles, two bicycle facilities, and two rules for safe bike riding.	1½-2 periods

Total Class
Time: 6-8
periods.

ACTIVITY #1

Mini-unit Topic: Learning About Bicycles and How They Are Used

Approximate Class Time: 2-3 periods

Capsule Activity Description: Students discuss the advantages and disadvantages of bicycling.

Objective:

By the end of the activity students will be able to name three advantages and three disadvantages of owning and riding a bicycle.

Concepts Treated:

- There are advantages and disadvantages to owning and riding bicycles.
- People have different views on what the advantages and disadvantages of owning and riding bicycles are.

Materials Needed:

Bicycle polls (Spirit Master #1).

ACTIVITY

Divide the class into small groups of 4 or 5 students. Ask each group to list the advantages of owning and riding a bicycle. When groups have completed their lists, a spokesperson for each group reads the list aloud. From these group efforts compile a master list on the chalkboard. A typical list might include

- Bicycling is faster than walking and more efficient in its use of body energy.
- Bicycling can be faster than commuting by automobile in traffic.
- There may be fewer parking problems with a bicycle than with a car; in addition, it may be possible to park a bicycle closer to one's destination than a car can be parked.
- Bicycling conserves energy.

- Bicycling does not pollute.
- Bicycling is healthy in terms of providing exercise and fresh air.
- It is fun to bicycle, fun for kids and adults.
- It can be relaxing to bicycle, relaxing in its own right and compared to driving a car in traffic.
- Bicycling affords opportunities for meeting interesting people.

As a class discuss these advantages and select those the class feels are the most important ones for owning and riding a bicycle.

Return the class to the groups. This time they list the disadvantages of buying and riding a bicycle. Follow the same procedure here as above. Examples of disadvantages that might be included on a master list follow.

- Bicycling can be unsafe, particularly in traffic.
- Bicycles are expensive.
- Bicycles are easily and frequently stolen.
- Bad weather--rain, cold, snow, and wind--make bicycle riding unpleasant or impossible.
- Bicycles cannot be used conveniently over long distances that must be travelled quickly.
- Smog and pollution, particularly from car exhausts, can make bicycling unpleasant and unhealthy.
- Owning a bicycle requires some maintenance.
- It is difficult or impossible to transport many things on a bicycle.
- It is difficult and risky (in terms of damage or perspiration) to wear good clothes while bicycling.
- Riders must have a minimum of good health and physical dexterity to ride a bicycle.

Discuss the items on the master list and again select those the class feels are the most important reasons why people don't buy or ride bicycles.

To determine how others view owning and riding bicycles, students write and conduct a poll. As a class or in small groups students formulate their questions. (A sample poll is offered on Spirit Master #1.) Each student then administers the poll to three people: a contemporary, a teenager, and an adult. When the polls are completed, the results are tabulated for each group polled. Student groups then compare results with each other and with the thinking of the class in its preliminary discussion on the advantages and disadvantages of owning and riding bicycles.

ACTIVITY #2

Mini-unit Topic: Learning About Bicycles and How They are Used

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students obtain maps of their community and plot usable bicycle trails for recreational and commuter transportation.

Objective:
By the end of the activity students will be able to identify suitable bike routes and explain why they are appropriate.

Concepts Treated:

- Bicycles are used in different ways for different purposes.
- To be safe, convenient, and fun, bike routes must meet certain standards.

Materials Needed:
Maps of the community.

ACTIVITY

Small groups of students obtain or are provided with maps of your local community and are given the following instructions.

1. Orient yourselves to the map by identifying familiar points, such as your homes and schools. Mark these on the map.
2. Identify one to three trips you, your friends, or the townspeople would like to be able to make occasionally or often by bicycle. These might be trips from home to school, home to shopping centers or lakes, or just scenic trips. Since you do not all live in the same house or neighborhood, you may have to compromise on the starting point for your route (the school, fire or police station).
3. Decide as a group what you want in a bike route in terms of safety, convenience, and fun. Develop a checklist of items in each of these categories. For example, under safety you might have wide streets, few cars, and low speed limits.

4. Plot on the map the best bicycle route for making the trip, keeping in mind your checklist. It is necessary that you be familiar with all the streets you may want to use on your route so that all possible dangers can be avoided.

5. Decide on how and when to take a test bicycle ride over the route(s) you have picked. You may want to separate or go together on the trip(s). Then test drive the routes, looking for the items you identified about safety, convenience, and fun.

When each group has completed its test drives, the groups reform and compare notes about their routes; whether they are viable bike routes, whether some parts of the routing need to be changed (and if so, how) or whether there is no good bike route between the points they identified. Each group then reports its routes to the class. The class selects several routes it feels would be most used by the community's bicyclers and breaks into small groups, each one perfecting its route map and writing descriptions of the route(s) for inclusion in a *Community Bike Book*. Students can distribute this book to interested members of the community.

ACTIVITY #3

Mini-unit Topic: Learning About Bicycles and How They Are Used

Approximate Class Time: 1 period

Capsule Activity Description: The class discusses recreational bicycle activities cyclists can organize and engage in.

Objective:

By the end of this activity, students will be able to defend, in writing or orally, reasons they would or would not want to participate in one or more recreational bicycle activities.

Concepts Treated:

- There are many different recreational uses for bicycles.
- Often different skills are required for various bicycle uses and activities.

ACTIVITY

Discuss recreational bicycling* activities around which students can form clubs or groups.

Touring is bicycling for pleasure in the countryside or suburbs for fifteen miles or more, one to several days. Two types of touring are conventional touring, where the cyclists travel light and use restaurants and motels for accommodations; and camping touring, where cyclists pack sleeping gear and cooking utensils and rough it.

Discussion for both types of touring can center on touring as a family activity or an organized chaperoned group activity; the relative advantages and disadvantages of each; equipment needed, such as spare tire, first aid kit, tools, and lightweight camping equipment; transporting bicycles to desired touring locations, using trains, ferries, buses, planes, and cars (there are two types of car racks: rear-end racks and roof racks; the advantages and disadvantages of each can be discussed);

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*Consult the Bibliography at the end of this chapter for sources of background information in this area.

concern for wind problems; and loop trips where the cyclists return to their point of departure without retracing their route.

The following organizations can assist tourists:

American Youth Hostels Inc.
20 West 17th Street
New York, New York 10011

League of American Wheelmen
5118 Foster Avenue
Chicago, Illinois 60630

American Automobile Association (AAA)
Local Office or
1712 G Street, Northwest
Washington, D.C. 20006

The following publications can assist tour planning:

U.S. Geological Survey Topography Maps
Distribution Section
1200 South Eads Street
Arlington, Virginia 22202

North American Bicycle Atlas
c/o Books About Cycling
Post Office Box 208
Nevada, California 95959

There are two major categories of bicycle racing: informal and organized. Organized racing is often conducted at colleges with teams. Information on other forms of organized racing can be obtained from the Amateur Bicycle League of America, 4233 205th Street, Bayside, Long Island, New York 11361. Informal racing can involve speed races, endurance races, cross country racing, slalom racing, coasting, "snail" racing (going as slowly as possible), sprinting, and pursuit racing (trying to catch up with another bicyclist).

There are many bicycle games that can be discussed, some of which are moderately dangerous if necessary precautions like padded clothing and helmets are not taken. Other games require using an old bicycle, since they may involve damage to participating bicycles. Examples of bicycle games are on the following pages. Other games include scavenger hunts, obstacle drops, and relays. These games can be discussed in terms of needed equipment, safety considerations, convenience, and forming clubs to engage in them. For rules of Bicycle Polo, write to U.S. Bicycle Polo Association, Post Office Box 565, FDR Station, New York, New York 10022.

There are all kinds of ornaments and decorations that can be painted on or otherwise added to bicycles, such as flags, mirrors, roll bars, radios, tassels, odometer, crepe paper, playing card noise makers in spokes of the wheels, flowers (real and plastic), and wild paintings and colors. While organizations are hardly necessary to add these ornaments, clubs can make their creation more fun.

After the discussion, students can participate in one or more of the Bike Games described in Activity #15. You may also wish to allow time during the following weeks for students to organize bicycle clubs and conduct meetings and activities.

ACTIVITY #4

Mini-unit Topic: Learning About Bicycles and How They Are Used   **Approximate Class Time:** 1½-2 periods

Capsule Activity Description: Students create their own imaginary culture or country with its own distinctive attitudes toward use of and laws regulating bicycles.

Objective:

By the end of the activity and the conclusion of the mini-unit, students will be able to name three uses of bicycles, two bicycle facilities, and two rules for safe bike riding.

Concepts Treated:

- Bicycles are used in different ways for different purposes.
- For safety reasons, certain aspects of bicycle riding must be regulated.

ACTIVITY

The students break into small groups and are given instructions to do the following: create an imaginary country or culture of your own. Give it a name, size, and population. Describe what bicycles are used for in your society and why. Describe who uses them. Describe the laws regulating their use. Describe what facilities, if any, are available--bikeways, parking areas--for bicycles. Describe how a typical family of four uses bicycles on an average day. Describe the safety rules people in your country should adhere to when riding their bicycles. Your society does not have to be doing all the right things about bicycles; it can be doing some wrong things or only wrong things.

Groups describe their societies to the class and the class compares results in terms of what features the societies have in common and which features would be desirable in our society and why. Each student then decides which society he or she would most want to live in and defends his or her selection. A sample imaginary country is included at the end of this activity.

Sample Imaginary Country

Babaland is a small country far away in the mountains of Hortu. Not many people live there because the climate is very cold and the mountains make it very difficult to get around. The one kind of transportation everybody uses is bicycles. Men, women, and children all own their own bicycles. Nobody is without one.

Bicycles are used for every purpose imaginable in Babaland. People ride their bicycles to the grocery store and to work, children ride to school, the mail is delivered by bicycle, even the Babaland doctors make housecalls on their bicycles.

There are some cars and a few trucks in Babaland, but not many. People just can't afford them, and anyway the roads in Babaland are just too narrow and steep for cars and trucks to pass easily. There are, however, trains that connect all the villages in the country and deliver food and other goods to the people.

There have never been any bicycle laws written down in Babaland. That is probably because bikes have always been used there and bikes have never seemed to cause any problems or harm. And, since there is no automobile traffic to speak of, bikes can use the entire roadway. Only once have I seen a bicycle accident. That accident was caused by snow and ice on the roads, making them very slippery. Even then, nobody got hurt, although the bicycles involved were damaged.

Babalanders are very courteous bicyclists. They ride on the right side of the road and never forget to use hand signals. They are also very careful of pedestrians and always give them the right-of-way. Everybody uses their bicycles wisely and safely, but they still have fun. Bicycles are important to the people of Babaland, so they store their bikes carefully in the bicycle racks that are found everywhere in all the villages. They maintain them safely and for a long life.

MINI-UNIT 2

LEARNING ABOUT BICYCLE PURCHASE AND MAINTENANCE

This mini-unit helps students learn how to purchase a bicycle to meet their needs and requirements. Knowing what to look for in a bike does not always ensure that the proper purchase is made. Other factors enter into influencing a bike purchase, such as advertising and parental and peer pressures. The unit also addresses these issues.

In addition to covering bicycle purchase, this mini-unit provides an activity dealing with bicycle maintenance and another on the prevention of bicycle theft. Many youngsters fail to maintain their bicycles either through laziness or ignorance. Other children fail to take precautions to prevent bicycle theft. These two activities point out the need to care for one's bike and describe how to do so.

The concepts that are dealt with in this mini-unit on purchase and maintenance include:

- There are many questions to consider before purchasing a bicycle, including how the bike will be used, how much it will cost, and what style of bike is most comfortable and reliable.
- People can take precautions to reduce the chance that their bicycle will be stolen.
- To make a bicycle last as long as possible, it is important to maintain it properly.

MINI-UNIT 2 LESSON PLAN

Learning about bicycle purchase and maintenance

Activity #	*Activities*	*Class Time*
5	DESCRIPTION: Students learn about purchasing a bicycle, then pretend they are bicycle advertisers and create their own advertisements. OBJECTIVE: By the end of this activity, students will be able to identify, orally or in writing, the steps to take when purchasing a bicycle.	2-3 periods
6	DESCRIPTION: Students role play scenes in which children try to persuade their parents to buy them a bicycle. OBJECTIVE: By the end of this activity, students will be able to determine and defend the appropriate outcomes for a given situation involving the purchase of a bicycle by a parent for a son or daughter.	1-1½ periods
7	DESCRIPTION: Students discuss methods for preventing bicycle theft. OBJECTIVE: After completing this activity students will be able to identify at least three things they can do to help prevent their bicycles from being stolen.	1½-2 periods
8	DESCRIPTION: Students learn about maintaining a bicycle and perform basic maintenance tasks on a bicycle. OBJECTIVE: After completing this activity, students will be able to identify five major maintenance tasks and describe at least two in detail.	1½-2 periods

Total Class
Time: 6-8½
periods.

ACTIVITY #5

Mini-unit Topic: Learning About Bicycle Purchase and Maintenance

Approximate Class Time: 2-3 periods

Capsule Activity Description: Students learn about purchasing a bicycle, then pretend they are bicycle advertisers and create their own advertisements.

Objective:

By the end of this activity, students will be able to identify, orally or in writing, the steps to take when purchasing a bicycle.

Concepts Treated:

- There are many things to consider before purchasing a bicycle, including how the bike will be used, how much it will cost, and what style of bike is most comfortable and reliable.
- One should be sure that the store from which one buys a bicycle is reputable and will give good service in the future.
- Advertising plays a large part in determining what kind of bicycle a person buys.

ACTIVITY

Discuss with the class the four aspects to consider when buying a bicycle:*

- Determining what characteristics the buyer wants, needs, and can afford in a bicycle
- Deciding where to buy the bike

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*Consult the Bibliography at the end of this chapter for sources of background information in this area.

- Actually buying the bike
- Selecting and purchasing accessories

The steps in determining what kind of bike to buy include

1. Determine what the bike will be used for--short trips, long trips, commuting, recreation, up hills, over rough terrain, racing, or touring.
2. Decide how long the bike will be owned.
3. Select the brand of bicycle.
4. Choose a style--racing, banana seat, or conservative.
5. Determine number of speeds or gears; 1, 3, 5, or 10.
6. Select handlebars; racing, conventional, or high-rise.
7. Select price range; 50 dollars, 100 dollars, 200 dollars, or over 200 dollars.
8. Select the proper size.

Remind students that all these steps should be performed with the help of a parent.

Three steps are involved in deciding where to buy a bike. With your parents, compare bike prices in different stores, including any assembly charges; determine stores' reputation for selling quality products and making competent repairs; and consider whether bike should be bought from a store that can and will repair it competently and promptly.

Before you purchase your bicycle

1. Examine the tires--are they sew-ups or clinchers? In good condition?
2. Select the right size bicycle.
3. Test-ride the bicycle.
4. Check the frame for defects and type of construction--welded or brazed.
5. Examine the warranty.

Selecting accessories can be discussed in terms of why they are desired or needed for safety, convenience, and aesthetic reasons. Examples of accessories include: lights (generator or lamp on the bicycle, worn on the rider, or both); locks; saddle bags, baskets, or book racks; tire pump; tire pressure gauge; water bottle; gloves; kickstand; toe clips, pant cuff clips; chain shield that prevents trousers from getting caught in chain; child seats; tire repair kit; cloth handlebar tape; car rack for transporting the bike; and bicycle safety flags for increased visibility.

Next, students take the role of bicycle advertisers and create ads to influence various types of people to buy bicycles or particular types of bicycles. The class divides into small groups and is given written and oral instructions to pretend they are the heads of an advertising agency. They must decide whom they want to persuade to buy a bicycle. For example, they may want to persuade young working people who commute to work, housewives who run errands, students who ride to school, or some other group of people they choose. They must decide whether they want them to buy a 1-, 3-, 5-, or 10-speed bicycle, a cheap, moderate, or expensive bike, lots of accessories, etc. Instruct the students to create an ad. They can use any materials or format, including songs, pictures, and dialogue.

Upon completion of advertisements, each group presents its ad to the class and responds to comments and criticisms from you and the other students. Direct the discussion to what ads reveal about why people buy bicycles and how they decide what kind of bicycles to buy. For example, if ads were pitched at the glamour appeal of racing bikes, does this indicate many purchasers choose what bike to buy in order to impress their friends or build up their own egos?

Finally, discuss the ads in relation to what students learned about buying a bicycle.

- Would these ads help you buy a bicycle?
- Do these ads help you buy the right bike for you?
- Do ads sometimes steer people toward buying the wrong bike--one that's too expensive or not right for your needs?
- Would you have to do anything else to find the right bike to buy besides read or listen to the ads? If so, what?

ACTIVITY #6

Mini-unit Topic: Learning About Bicycle Purchase and Maintenance

Approximate Class Time: 1-1½ periods

Capsule Activity Description: Students role play scenes in which children try to persuade their parents to buy them a bicycle.

Objective:

By the end of this activity, students will be able to determine and defend the appropriate outcomes for a given situation involving the purchase of a bicycle by a parent for a son or daughter.

Concepts Treated:

- Many things must be considered before buying a bicycle.
- People have different reasons for buying and owning a bicycle.

ACTIVITY

Students role play scenarios in which children ask their parents to buy them a bicycle. Sample role profiles are provided on the next two pages.

Students who are participating in the role plays leave the room while the profiles are read to the class and very briefly discussed. The students return to the room and each one reads the profiles to him- or herself or you can read them to them quietly. The role plays are then acted out spontaneously.

After each role play, participants discuss the feelings they had while role playing. Other students discuss what they would have said and done had they been involved.

At the end of the role play session, list on the chalkboard (1) the responses parents can offer to children who ask for a bicycle and (2) the reasons children can give for why parents should buy them a bicycle. Students can then create their own role profiles to act out and discuss.

Sample Role Profiles

Daughter

You are twelve years old and have outgrown your old bicycle. You want your parents to buy you a new ten-speed bicycle because they are more fun and easier to ride up hills. Most of your friends have ten-speed bikes, too, and you feel left out because you don't have one. You've just come in the house after tipping over on your old bike because it's too small for you. Your parents are in the kitchen having coffee. What do you say to them?

Parent

Your daughter has been riding a bicycle that she is getting too big for. You've been expecting her any day now to tell you she wants a fancy new bike. You feel that all she needs is a three-speed bike, even though you could probably afford a more expensive one. But she'll just outgrow this new bike in a couple of years, too, so why spend the money on an expensive bike now when she'll need another one in a few years? Your daughter has just come into the kitchen looking as though she wants something from you.

Son

You have a run-down bicycle that is bent out of shape and is almost impossible to ride. You have to walk it up hills, it's in such bad shape. You've mentioned to your father several times that he should buy you a new bike, but every time you do, he says, "We can't afford to buy a new bike just because your old one isn't perfect. Why, when I was your age (13) I never even had a bicycle. I walked everywhere I wanted to go." But last week your father bought a second-hand Buick Electra for $3,200 when all he needed was a Ford or a Chevrolet. And he says he can't afford a new bicycle, which would cost only $75! You've just come in from another rotten bike trip, and your father is sitting in the living room watching TV. You're ready to really put it to him. What do you say?

Father

Your son has complained to you several times that his bike isn't good enough for him; it's broken down and hard to ride. You realize it's not the best bike in the world, but it'll do for another year or so. Why does your son at age thirteen need a fancy new bike for the short trips he makes? Besides, he'll just scrape and bang up a new bike and it'll look like his old one in two weeks. Anyway, you can't really afford a new bike. You have to make payments on the secondhand Buick Electra you just bought for $3,200, so you're really strapped for money. At least you bought a good car that will last a long time and not cost you a lot in repairs, though. Your son has just come into the livingroom where you're watching TV. He looks pretty mad about something.

Son

You are eleven years old and really know how to enjoy life and impress your friends. But you've got this beat up old bike that your friends make fun of and you hate to ride. ("Hey, Joe, you'd have to pay someone to steal that piece of junk!" they yell at you.) This morning, your best friend showed up at school with a brand new bicycle with a banana seat, high handlebars, a roll bar, and a five-speed stick shift. It made you feel awful. You've just come home now from school ready to order your father (mother) to buy you one like your friend's. What do you say?

Parent

You have an eleven-year-old son who is pretty wild sometimes, and you have to keep a sharp eye out on him. Only last week, he got mad at a neighbor who was complaining that he and his friends were making too much noise playing stick ball in his back yard. Your son has an old fashioned bicycle with regular handlebars and thick tires. He's been pestering you to get him one of those new flashing bicycles that have banana seats, high handlebars, and five-speed stick shifts. You're afraid that if you get him one, he'll treat it like a racing motorcycle and go around doing all kinds of reckless things. Besides, it will probably get stolen in a week. So you have no intention of buying him that kind of bike, although you feel he may be ready for a new bike of some kind. Your son has just come home from school looking as though he wants to talk to you about something.

ACTIVITY #7

Mini-unit Topic: Learning About Bicycle Purchase and Maintenance

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students discuss methods for preventing bicycle theft.

Objective:
After completing this activity students will be able to identify at least three things they can do to help prevent their bicycles from being stolen.

Concept Treated:

- People can take precautions to reduce the chance that their bicycles will be stolen.

ACTIVITY

Students write responses individually to the following scenario:

You have just been given a new bicycle. Your last one was stolen, but your parents decided they could afford to buy you another one. You know that you will not be able to have a third one if this one is stolen. What do you plan to do to make absolutely sure this one isn't stolen?

The following day students break into small groups and are given written instructions to read each paper out loud; list all the methods mentioned for keeping a bicycle from being stolen; and discuss and record which of them will really help and why.

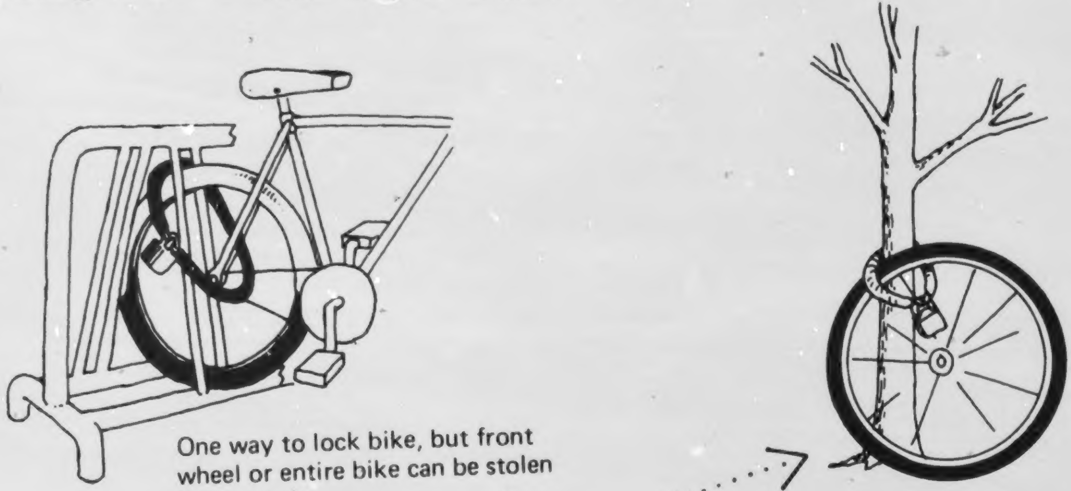
The groups present their conclusions to the class and respond to questions and comments from other groups and from you. You might also suggest methods not mentioned by students, such as trading in the new bike for an old beat up one that fewer people are likely to want to steal; using a lock--using a particular type of lock, such as the Kryptonite bike lock (KBL) designed by students at the Massachusetts Institute of Technology, or a heavy-duty tempered metal chain and lock; locking the bike to a solid, immovable object; and passing a chain through both wheels and the frame, as well as the object.

You may also suggest asking someone to keep an eye on the bike while it is out of sight; locking the bike to a fixed object; removing the front wheel and locking it up too; registering the bicycle with police to facilitate police identification of stolen bikes and locating owner if bike is stolen and recovered; keeping a record of bike's brand, model, number and serial number; asking parents to a-d the bicycle to personal-property floater of their homeowner's insurance policy; asking parents to consider purchasing bike theft insurance sold by some bike dealers; and using the Rally Rack, a theft prevention rack.

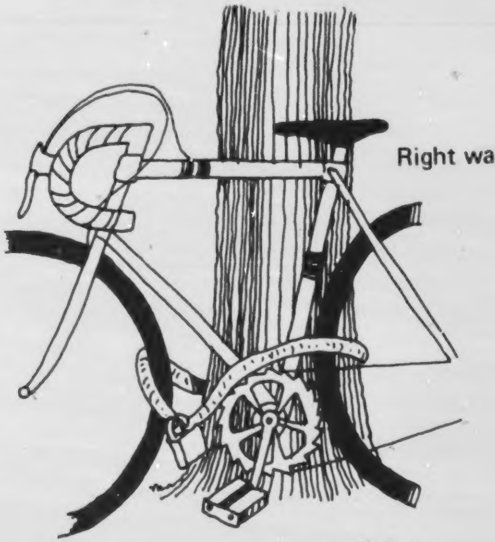
Variations and Supplementary Activities:

A police officer can come to class to discuss bicycle thefts, the importance of putting bikes away after use, and safe parking when visiting a friend's house.

Students can write a brochure for other students and for the community on how to reduce bicycle thefts.



One way to lock bike, but front wheel or entire bike can be stolen leaving only . . . . the wheel



Right way to lock bike.

ACTIVITY #8

Mini-unit Topic: Learning about Bicycle Purchase and Maintenance

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students learn about maintaining a bicycle and perform basic maintenance tasks on a bicycle.

Objective:
After completing this activity, students will be able to identify five major maintenance tasks and describe at least two in detail.

Concepts Treated:

- To make a bicycle last as long as possible, it is important to know how to maintain it properly.
- Different bicycles require different maintenance tasks.

Materials Needed:
Several bicycles.

ACTIVITY

Discuss with the class basic maintenance* tasks bicycle owners can and should perform. Such tasks include:

1. *Tire care:* maintaining proper tire pressure (indicated on most tire sidewalls); being careful about filling tires with air, particularly with gas station pumps which can be inaccurate and cause tire explosions; not abusing tires by riding over curbs, riding double, and skidding to a stop; not letting bicycle stand for any length of time on under-inflated tires.
2. *Lubrication,* according to bicycle manual instructions: of brakes, derailleur, chain, pedal, and other parts.
3. *Tightening* bolts and screws periodically.
4. *Adjusting brakes* as they wear or loosen by turning the appropriate screw.
5. *Keeping the bicycle dry* and free from mud.

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*If you need background information consult any of the books listed in the Bibliography at the end of this chapter under "Maintenance and Repair."

Follow-up discussion can center on reasons maintenance is important, such as making sure bicycle riding is as safe as possible (e.g., by having working brakes); making riding as easy as possible (through lubrication and proper tire pressure); ensuring a longer lasting bike (by wiping it when it is wet); avoiding inconvenient equipment failures and breakdowns on the road (flat tires, lost bolts or screws); and maintaining resale or trade-in value.

The class divides into small groups and each group is assigned or selects one of the following maintenance tasks: lubrication, tire care, tightening bolts and screws, and adjusting brakes. Different groups can be assigned to work with different types of bikes (racing, high-rise, one-speed, etc.) or all can work on the same type. Each group is responsible for learning how to perform its task well. The group gets together after school to practice its task on a bicycle donated by a group member, parent, faculty member, or member of the community. After becoming proficient in its maintenance task, group informs you it is ready to demonstrate the task to the rest of the class. On the same day or during different classes, groups then perform their maintenance task in front of the class with an actual bicycle and explain what they are doing. Other members of the class ask questions and comment on the proficiency of the group demonstrating the task.

Variations and Supplementary Activities:

Students can prepare a brochure for classmates and others on how to perform basic maintenance tasks.

A bicycle mechanic can be invited to class to evaluate each group's performance and offer suggestions of his or her own.

Each group can perform in front of the class one of the maintenance tasks it did not present. Performance is critiqued by the group whose specialty that task was.

MINI-UNIT 3

USING YOUR BICYCLE SAFELY

Mini-unit 3 focuses on bicycling safety as it relates specifically to riding a bike. The unit identifies unsafe practices as well as engaging the class in discussions and role plays of the many emotional and behavioral factors, such as peer pressure and the desire to take risks, which can often lead to unsafe bicycling. Several of the activities deal with these affective causes of unsafe bicycling practices, making students aware of these behaviors and helping pupils overcome them.

In addition to identifying unsafe behavior, the mini-unit defines correct bicycling practices and includes an entire activity on developing good bicycle riding skills.

Among the concepts addressed in this mini-unit, the following are particularly important:

- Careless bike riding can be dangerous, leading to a wide variety of potentially serious, or even fatal, accidents and injuries.
- There are often emotional factors involved in riding a bicycle unsafely.
- Peer pressure to ride unsafely arises on many occasions and for different reasons.
- Certain skills must be developed to ride a bicycle safely and well.

MINI-UNIT 3 LESSON PLAN

Using your bicycle safely

Activity #	*Activities*	*Class Time*
9	DESCRIPTION: Students learn about bicycle safety and distinguish safe from unsafe bike riding behavior. OBJECTIVE: After completing this activity students will be able to identify unsafe bicycle practices and indicate the correct behavior for each one cited.	1½-2 periods
10 Sprit Master #2	DESCRIPTION: Students take a poll on their experiences with bicycles. OBJECTIVE: After completing this activity students will be able to identify from one to three unsafe practices they engage in as bicyclists and the corresponding safe behavior.	1 period
11	DESCRIPTION: Students engage in one or more mini-activities designed to teach students to identify some of the emotional factors involved in riding a bicycle. OBJECTIVE: By the end of the activity students will be able to define peer pressure in relation to bicycle safety.	½-1 period/ mini-activity
12	DESCRIPTION: Students role play and discuss scenarios in which a person is about to ride unsafely or is being pressured to ride unsafely. OBJECTIVE: After completing the activity, students will be able to describe the most appropriate behavior or course of action to take in a given unsafe bicycling situation.	1-1½ periods

Activity #	*Activities*	*Class Time*
13 Spirit Master #3	**DESCRIPTION: Students engage in bicycle riding skill development activities that are designed to promote safe riding.** OBJECTIVE: After engaging in three or more of these exercises, students will be able to perform the first of the series of exercises and score higher than the class average on the first round.	½-1 period per exercise

Total Class Time: 4½-6½ periods.

ACTIVITY #9

Mini-unit Topic: Using Your Bicycle Safely

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students learn about bicycle safety and distinguish safe from unsafe bike riding behavior.

Objective:

After completing this activity students will be able to identify unsafe bicycle practices and indicate the correct behavior for each one cited.

Concepts Treated:

- Careless bike riding can be dangerous, leading to a wide variety of potentially serious--or even fatal--accidents and injuries.
- Bicycle safety rules--if followed carefully--can prevent serious bike accidents; such rules include obeying normal traffic regulations, using or wearing special equipment, making an effort to concentrate on what the other fellow is doing on the road, and keeping a bicycle well maintained and in good condition.

ACTIVITY

Conduct a class discussion on bicycle safety.* Such a discussion should consider

Basic Information about Numbers, Types, and Causes of Bicycle-related Accidents in the United States

- Bicycle accidents cause the most injuries requiring emergency ward treatment each year (460,000).
- There are 1 million bicycle-related injuries a year, including 60,000 concussions and 120,000 fractures.

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*The information and illustrations at the end of this activity may help to enhance this discussion.

- Bicycle accidents cause 1000 deaths a year--three a day.
- Twenty percent of bike accidents occur in rural areas.
- Approximately 26 percent of bike fatalities occur at night.
- Two-thirds of bicycle deaths involve children aged 5 to 14 years.
- Bicyclists are not protected in spills or crashes, while auto drivers are.
- Additional safety information is provided in the Consumer Product Safety Commission report that appears before the illustrations which follow this activity.

Major Safety Rules

- Obey the laws.
- Ride with the traffic; riding against traffic can result in running into cars coming out of driveways and roads, because auto drivers do not check for traffic coming down on the wrong side of the street; running into doors opened from parked cars for the same reason; running into cars on curves, since car drivers will hug the inner side of the road and cannot see a bike rider (nor can the bike rider see the car) until it is too late; and compounding the speed of the car and the bike if they collide.
- Do not speed; speeding makes it harder to avoid pedestrians, potholes, glass, sand, drains, and other vehicles.
- Signal all turns, so that cars don't run into you as you turn.
- Don't hitch rides with other vehicles.
- Don't ride sidesaddle or on the handlebars.
- Don't weave in and out of traffic.

Special Situations and Equipment

- Use lights, reflectors, and light-colored clothing when riding at night; the French two-way armband is especially good.
- Slow down in rainy weather to avoid skids (wet leaves are especially dangerous); brakes, especially caliper ones (hand brakes), function poorly in wet weather.
- Wear protective helmets, particularly when riding on streets and highways.
- Wear clips over long pants to keep cuffs from catching in gears; make sure shoelaces are short for the same reason.

- Avoid traffic whenever possible.

- Don't ride two or more abreast on the road; keep single file.

- Avoid bicycles with high handlebars and small wheels--they are involved in a large percentage of accidents because they are less stable.

- Avoid trying tricks such as "wheelies" (riding on rear wheel only) and "jumpies" (slamming on the brakes so the bike will fly through the air).

- Do not ride a bicycle that is too small or too large.

Concentration While Riding

- Watch for cars coming out of driveways and side streets.

- During sunsets and rainy days, be especially careful of cars because they may not be able to see you.

- Watch out for sudden moves by pedestrians.

- Listen for cars coming up behind you.

- Look out for opening doors on parked cars.

- Watch out for potholes, drains, sand, and glass.

- Be especially careful and observant at intersections.

Maintenance of Bicycle

- See Activity #8, a class discussion on bicycle maintenance. Maintenance tasks include tire care, lubrication, tightening bolts and screws, adjusting brakes, keeping bicycle dry and clean.

Registration of Bicycle

- In an emergency, a bike registration may help police to contact your parents or other relatives. This may also help to recover lost or stolen bikes.

Class discussion can follow on such issues as (1) why riders commonly ignore many of these safety rules and (2) what can be done to encourage riders to practice these rules.

Next ask students to write brief descriptions, real or fictional, of any biking behavior of one adult and one teenager or child. The descriptions must include how they *handle* their bike and where and when they bicycle.

The following class, students break into small groups and are given written instructions to

1. Read each description aloud.
2. List the different ways students described bicycling.
3. Discuss and record which of these ways of bicycling are safe and which are not.
4. Discuss and record how you ended up deciding what is safe bicycling behavior and what is unsafe. End up with a definition that begins "Biking is safe if it..."

Groups report results to class and respond to questions and comments from class.

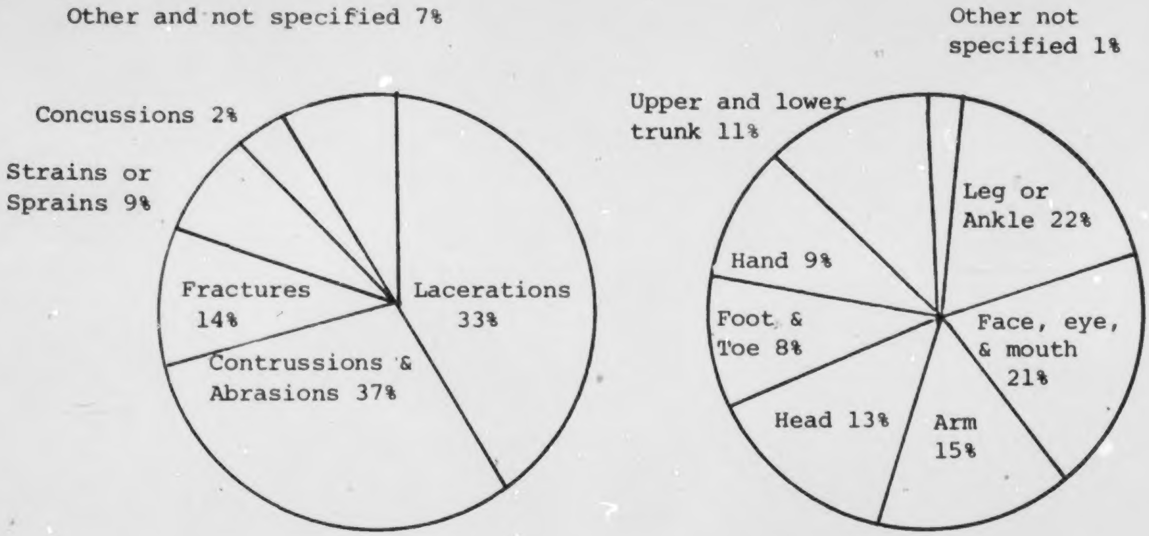
Variation or Supplementary Activity:

Each student can write a first-person autobiographical account of a bike trip that involves as many safe riding practices as possible. Students exchange papers and one student identifies all the safety items included in one other student's paper.

BICYCLE INJURIES

Summary of NEISS matrix data on bicycle injuries

(From the Consumer Product Safety Commission)



Type of injury

Body part injured

For 7/1/75 through 6/30/76 injury cases reported by the National Electronic Injury Surveillance System. Total bicycle injuries were 21,117 for this period.

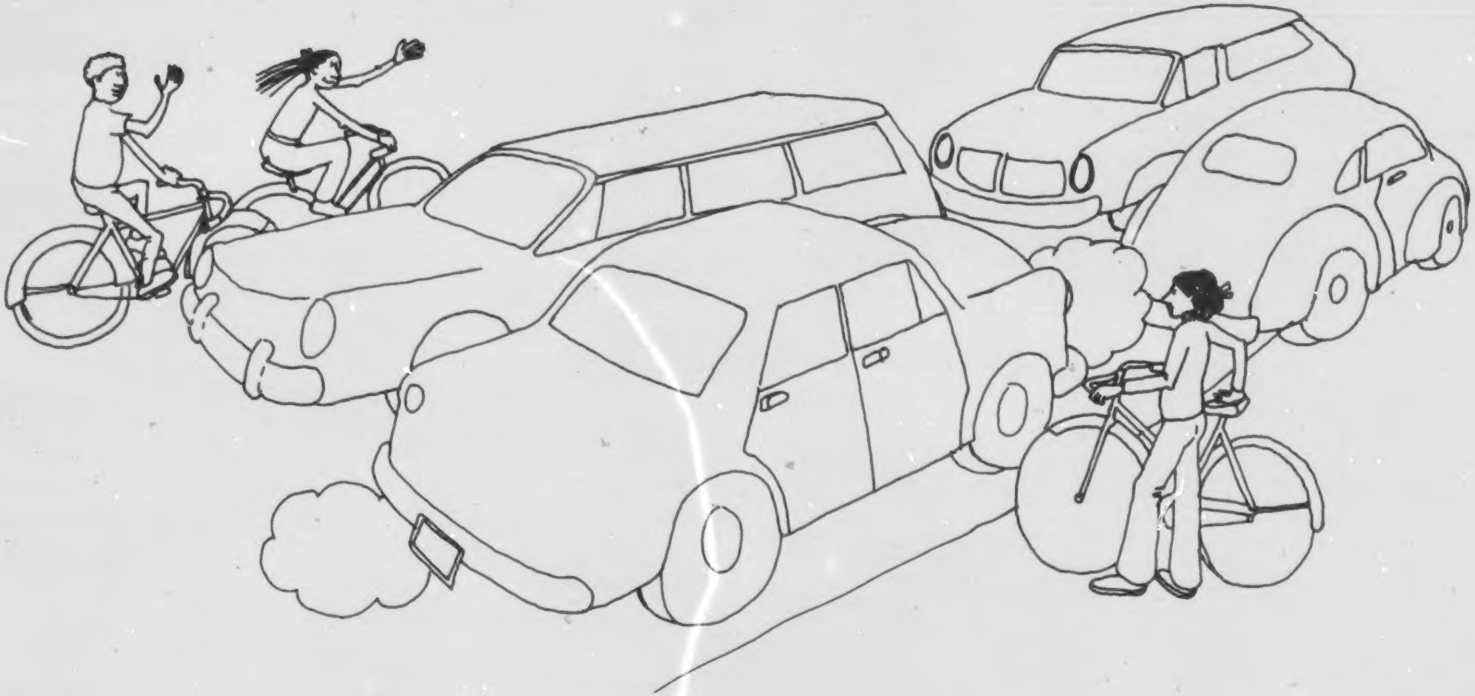
During the 12-month period, July 1, 1975 through June 30, 1976, data on 21,117 injuries associated with bicycles were collected by the National Electronic Information Surveillance System (NEISS). The majority (70 percent) of the victims suffered either lacerations or contusions and abrasions. Fractures were third, accounting for 14 percent of the injuries. There is broad distribution among body parts injured. Most (74 percent) of the injuries were to children under 15. However, injuries to bike riders over 15 occurred with frequency and severity sufficient to merit consideration. Twice as many males as females suffered injuries.

Reasons for accidents are similar for both sexes in all age groups. Losing control is one of the most common factors cited in bicycle accident investigations. However, in many cases, loss of control followed some other factor such as riding double, stunting, and foot slippage; or resulted from poor design or component failure. The chart below breaks down bicycle injuries by age and sex as identified by NEISS.

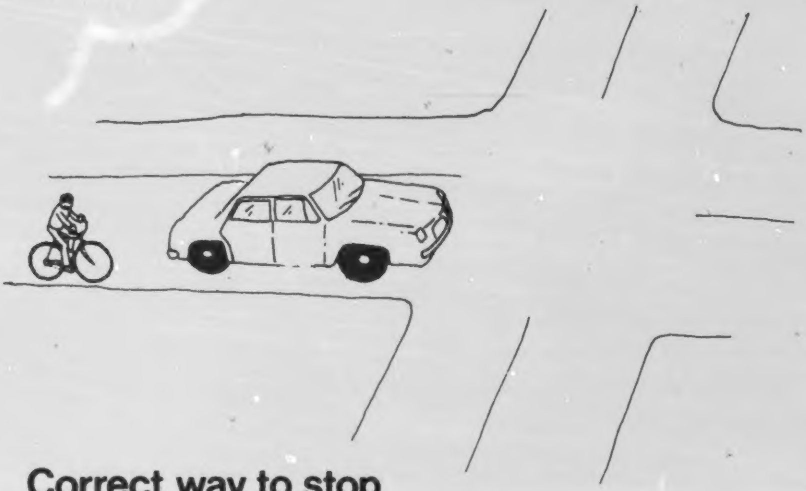
BICYCLE INJURIES

Age and sex distribution

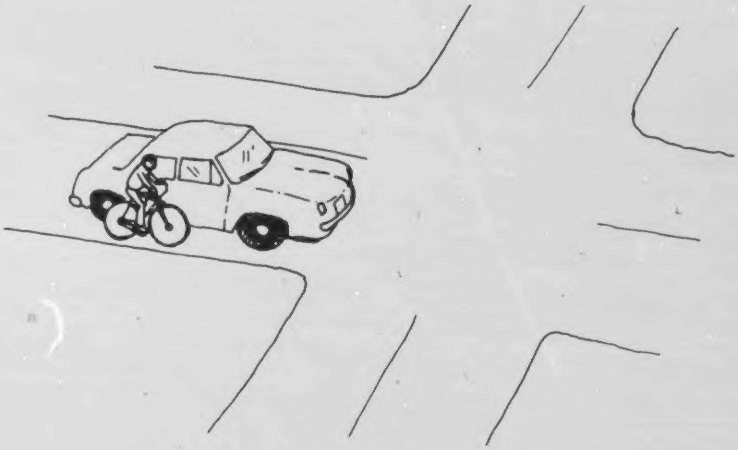
Age	*Percentage*	*Age*	*Percentage*	*Sex*	*Percentage*
0-2	1	20-24	5	Males	67
2-4	9	25-34	4	Females	33
5-9	31	35-44	2		
10-14	33	45-54	1		
15-19	13	55-64	1		
		65+	less than 1		



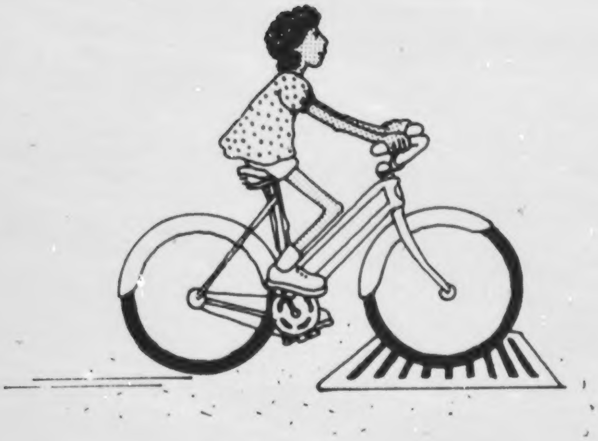
What are the bike riders doing that's unsafe?



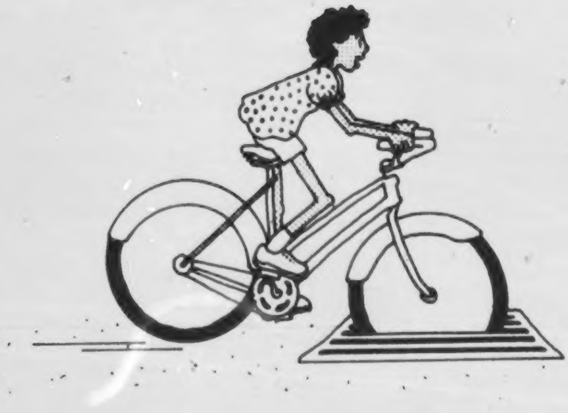
Correct way to stop



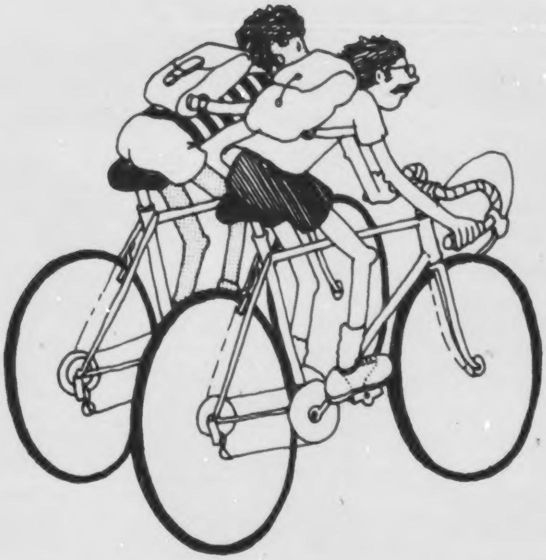
Incorrect way to stop: Car may not see cyclist and make sudden right turn, knocking over the cyclist



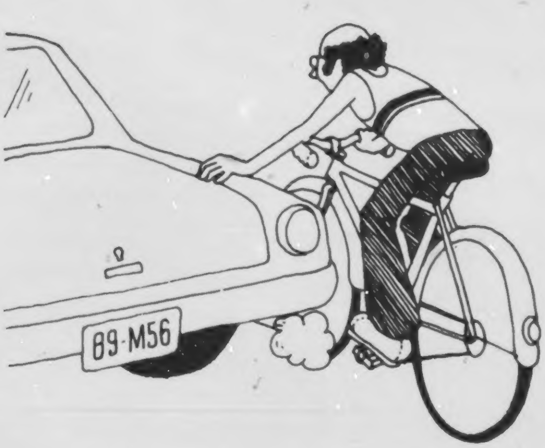
Right way to ride over gratings



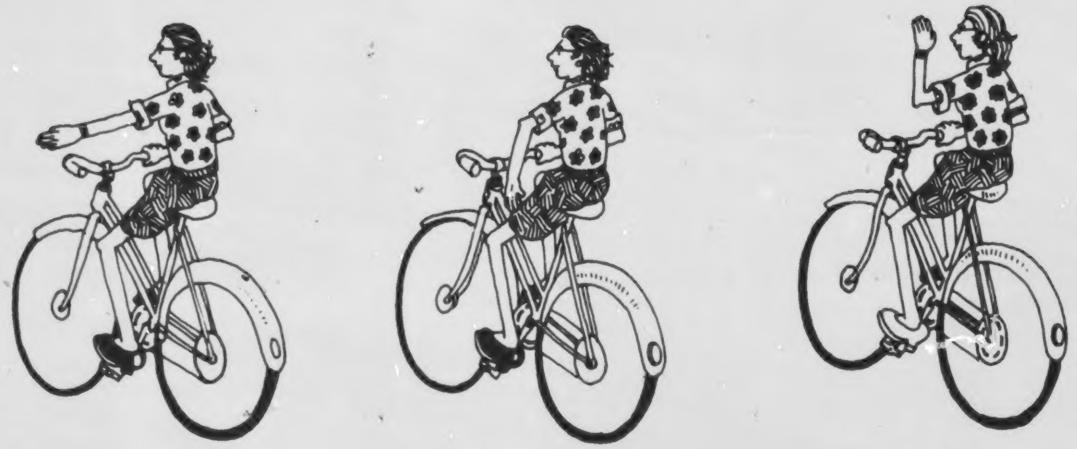
Wrong way to ride over gratings



What's unsafe about this?

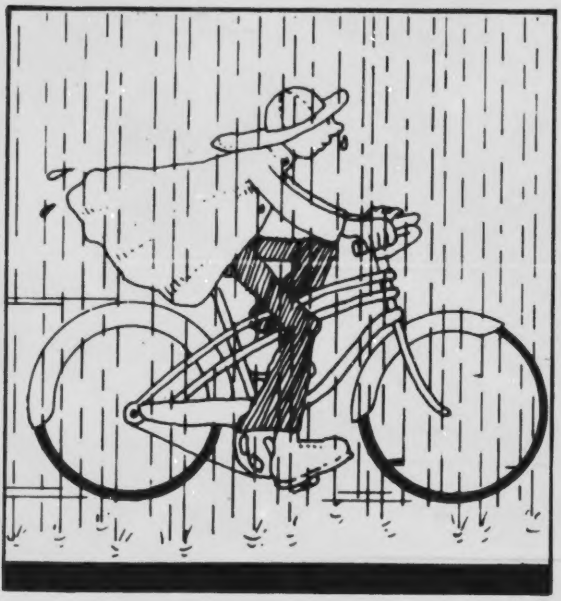


What's unsafe about this?

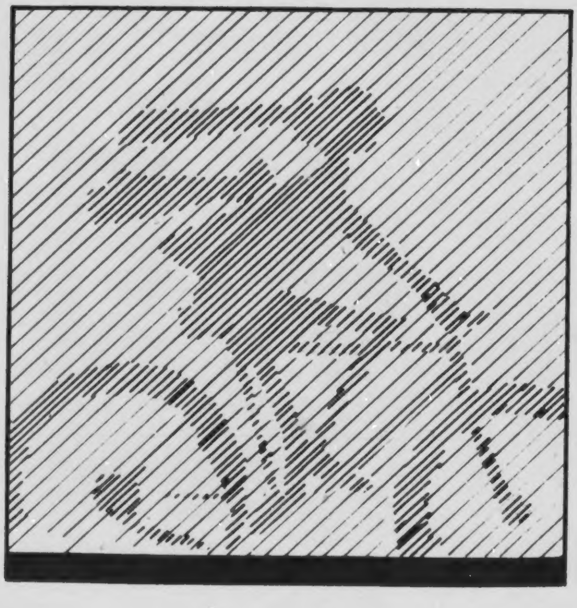


Left Turn Stop Right Turn

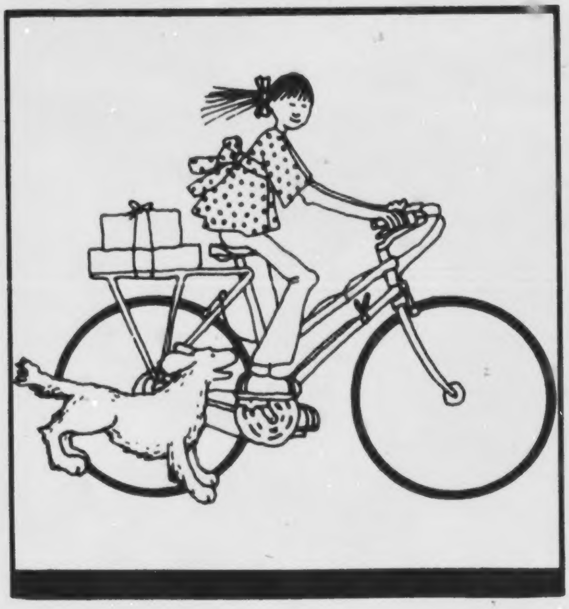
Proper way to signal turns and stops



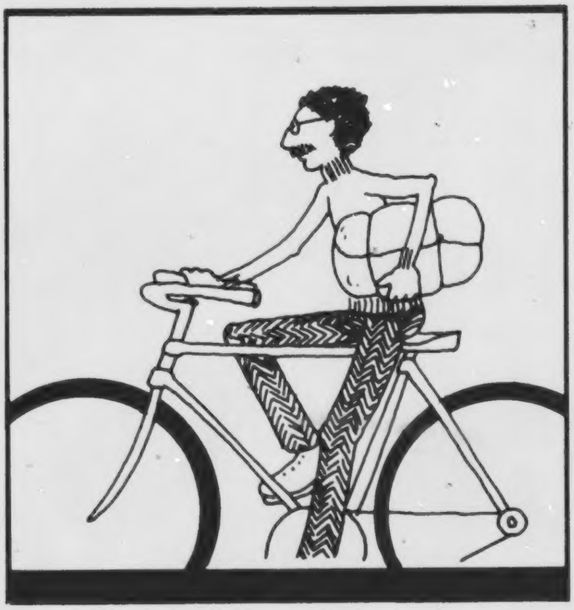
SAFE (bright clothing)



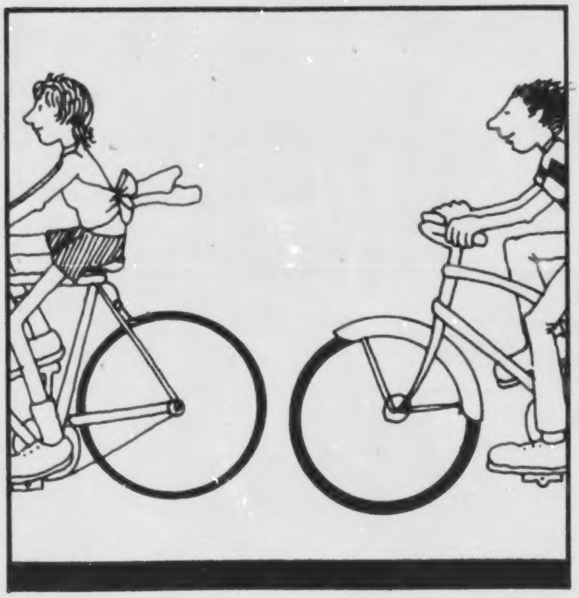
UNSAFE (wearing dark clothing)



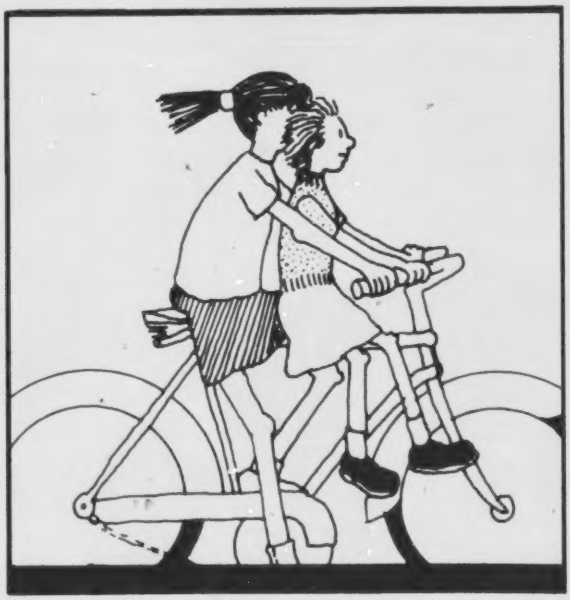
SAFE (ignoring dog)



UNSAFE (both hands not on handlebars)



SAFE (single file)



UNSAFE (riding sidesaddle)

ACTIVITY #10

Mini-unit Topic: Using your Bicycle Safely **Approximate Class Time:** 1 period

Capsule Activity Description: Students take a poll on their experiences with bicycles.

Objective:
After completing this activity students will be able to identify from one to three unsafe practices they engage in as bicyclists and the corresponding safe behavior.

Concepts Treated:

- There are many different reasons why people ride bicycles safely or unsafely.
- Unsafe bicycle riding practices can be easily identified.

Materials Needed:
Bicycle polls (Spirit Master #2).

ACTIVITY

Before taking the experience poll, students anonymously write on a blank questionnaire their predictions concerning how they expect their own class to respond to the questions. Students then take the poll anonymously. You can use the poll provided on Spirit Master #2. The students can help you tabulate the results immediately afterwards on the chalkboard. The class compares its predictions of the poll results with reality and discusses any discrepancies between the two. Discuss how, why, and when people bicycle, using the poll results as a take off-point. For example, do students who bicycle to school or work behave more or less safely than those who bicycle for fun? Do boys bicycle less safely than girls? You can also raise the issue of why some students and other people ride more or less safely than others: is it due to age, sex, parental attitudes and behavior, peer pressures, previous bicycling experiences, or other factors? See if your students can identify the safe and unsafe bike riding behaviors underlying Questions 5 through 14. Results of the poll can be compared with National Safety Council findings on the most common cyclist traffic violations:

1. Riding in the middle of the street
2. Failure to yield right-of-way
3. Riding too fast
4. Disregarding traffic signs or signals
5. Riding against the traffic

Variation or Supplementary Activity:

Students can develop their own bicycle polls either as a class or in small groups and administer them to friends and parents.

ACTIVITY #11

Mini-unit Topic: Using your Bicycle Safely

Approximate Class Time: ½-1 period per mini-activity

Capsule Activity Description: Students engage in one or more mini-activities designed to teach students to identify some of the emotional factors involved in riding a bicycle.

Objective:
By the end of the activity students will be able to define peer pressure in relation to bicycle safety.

Concepts Treated:

- There are often emotional factors involved in riding a bicycle unsafely.
- There are ways of refusing to do what one knows is unsafe while still not looking like a fink or a wet blanket to one's peers.

Materials Needed:
See individual mini-activities.

ACTIVITY

Students engage in one or more mini-activities geared to revealing some of the emotional factors involved in being motivated to ride safely, such as peer pressure, desire for thrills or kicks, and the it-won't-happen-to-me philosophy. Discussion of these emotional factors in safety can follow each activity.

1. Students invite parents other than their own (to avoid embarrassment) to class to participate in a discussion of bicycle rules they set for their children and the reasons for these rules. Such issues as separate rules for boys and girls, older brothers and sisters, more privileges for boys even though they may be younger than girls, are covered. If there is no valid reason for such rulings, a discussion takes place on why there is a double standard or sex discrimination.

2. Students make and use puppets for putting on a puppet show about peer pressure or different rules for different kids, for example, a

discussion among a group of students (puppets) trying to convince another student to play chicken on bicycles with them. The solitary student knows he shouldn't play chicken but wants very much to be accepted. (This is a particularly good activity for students who are uncomfortable standing in front of a group but can exhibit their feelings behind the guise of a puppet.)

3. Students make their own filmstrip showing one friend trying to persuade another to ride at night even though neither has night lights on his or her bike. Filmstrips are easily made by drawing or painting on blank, clear filmstrip leader. This can be threaded through a filmstrip projector. Students can also paint or draw on clear plastic, which is then put on two rollers. When it is unrolled slowly in front of a light, it produces the same effect as a filmstrip projector.

4. Students draw comic strips (showing characters' speeches printed in balloons) in which one character tries to promote safe bicycling behavior, while the other cartoon characters argue that they wouldn't be cool if they didn't play chicken on their bicycles or weave in and out of traffic. The characters arguing for bicycle safety defend their position. Students can work in groups of two, each student taking turns filling in a cartoon box.

5. Students divide into two groups and debate the affective areas of bicycle riding. One groups is the pressurer (bully), the other the students being pressured. Debates about why such action on bicycles should or should not take place will recall to most students events in their own lives of the same nature. Care should be taken by the teacher to see that such debates do not get out of hand, but remain, rather, strong discussions about the pros and cons of proper bicycle usage.

6. Using large sheets of butcher paper, students list pros and cons under the headings LET'S BE COOL or WHY NOT PLAY CHICKEN. Below is an example of such a list.

Let's Be Cool

Pro	*Con*
All my friends ride at night even though they don't have lights on their bikes.	It's nearly impossible for automobile drivers to see a bicycle at night if the bike has no light.

7. Students role play calling problems into a "hotline." Using a play telephone, one student calls a hotline person about his problems in dealing with peer pressure concerning bicycle usage, while another student role plays the hotline answers.

ACTIVITY #12

Mini-unit Topic: Using Your Bicycle Safely

Approximate Class Time: 1-1½ periods

Capsule Activity Description: Students role play and discuss scenarios in which a person is about to ride unsafely or is being pressured to ride unsafely.

Objective:

After completing the activity, students will be able to describe the most appropriate behavior or course of action to take in a given unsafe bicycling situation.

Concepts Treated:

- Peer pressure to ride unsafely arises on different occasions and for many reasons.
- There are ways of refusing to do what one knows is unsafe while still not looking like a fink or a wet blanket to one's peers.
- It is one's responsibility, as a friend, to tell another person when he or she is riding unsafely, but this can be done in different pleasant and unpleasant ways.

ACTIVITY

Students role play scenarios in which someone is about to ride his or her bicycle unsafely. Sample role profiles appear on the following pages. Students who are participating in the role plays leave the room while the profiles are read to the class and very briefly discussed. The students return to the room and each one reads the profiles to him- or herself, or you can read them to each role player quietly. The role plays are then acted out spontaneously. After each role play the participants discuss the feelings they had while role playing. Other students discuss what they would have said and done had they been involved.

When discussing the role plays emphasize some or all of the following issues:

- Why do people exert pressure on other people?

- How can a person resist peer pressure?
- Why do people ride dangerously when they know it is unsafe?
- What are some examples of positive peer pressure?

Variations and Supplementary Activities:

Students can write a *Handbook for Safe Bicycle Riders* on how to resist peer pressure to ride dangerously.

Students write responses to "Deeb Abby" letters from writers inquiring about what to do when they are pressured to ride dangerously.

Students create situations in story form in which a person who is about to ride dangerously is confronted by a friend. However, students do not conclude the story, but rather stop at the point where the friend has the opportunity to intervene. Then, students exchange stories and write two endings to one other student's story, describing how it would probably end in real life and how it should end.

Sample Role Profiles

Asked for a Ride

Passenger

You are downtown and run into a friend on his bicycle. What luck! You were going to have to walk home or take the bus, but it's a long walk, three miles, and you don't want to spend that 25¢ on a bus ride. Your friend lives only three blocks from your home, so your naturally ask your friend to give you a ride on his bike.

Rider

You just got a new bike a week ago but nearly wrecked it yesterday riding a friend on the handlebars. You feel you ought to be able to control the bike with someone on the handlebars, but in the city traffic it's sometimes very difficult, and you don't want to ruin your bike in another spill. But you've just run into a friend and wouldn't you know it, he'll probably ask you for a ride home since he lives only three blocks from you. What will you do if he asks?

Offered a Ride

Rider

Your Little League Baseball game is over and you just pitched a one-hitter. You're feeling terrific, as if you could make the majors by the time you're sixteen. As you get onto your bike to pedal home (about two miles away), you notice that Sam, a friend of yours, is starting to walk to his home. He lives a mile from you. You offer him a ride on your bike thinking, I'll be able to do him a favor and at the same time it will give me an excuse to see his cute sister when I get him home.

Passenger

Your Little League game is over and you're bushed. You're team won behind the one-hit pitching of Robert, whom you, as a mere second baseman, admire a lot. The though of walking all the way home (it's three miles) makes you even more tired. But Robert has offered to ride you on the handlebars of his bike. What a thrill! But Robert rides very fast and goes through stop signs and red lights without looking for cars. Your parents have warned you not to ride on handlebars and if you come home injured or scraped up you'll be grounded for a week. But you'll feel like a fool to turn down a ride from the team pitcher. What are you going to do?

Person Being Pressured

Your friends are talking about taking a ride this evening down to the park (or movies, or countryside) but you, Tom, don't like to bicycle at night because of the traffic and because you don't have a light for your bicycle. Most of your friends don't have lights on their bikes either, but that doesn't seem to bother them. You had a couple of close calls with cars last week during the daytime, and you're not about to ride your bike through the traffic at night without lights. The problem is these are your close friends and they're really going to come down on you if you refuse to join them. What will you say?

Person Pressuring the Friend

You, Tom, and your friends feel it would be a lot of fun to bicycle down to the park (or movies, or countryside) this evening. You're at Tom's house right now. You know all the other kids will go along with the idea, but Tom might not. He seems to be careful about the things he does, like riding a bike at night. He doesn't know how to live and enjoy life. So if he says he won't go with you, you're going to make him go--it's time he stopped being so chicken and started acting like an adult. So you suggest, "Say, let's bike down to the park this evening and have ourselves some fun!"

Another Person Pressuring the Friend

You, Bill, are bored again, wondering what you'll do this evening. You're just waiting for someone in the group to come up with an exciting idea. You know Tom won't come up with one, he never suggests doing anything interesting. He always comes along, though, but sometimes he complains that you and the others are crazy--that you do foolish things. If you do think of something to do, you hope Tom doesn't throw a wet blanket on the idea and spoil it for the rest of you.

Person Being Pressured

Your parents have told you, Barbara (Bob), that you are not to bicycle along Main Street under any condition. If they catch you doing it, they'll take your bike away for a week. They say there's too much traffic on Main Street and it's no place for a little girl (boy) like you to be. The trouble is, the only way to get to the park is down Main Street. Otherwise, you have to go three miles out of the way on a bunch of side streets, and by the time you do that, you'll have to turn right around and come home for dinner. Susan is with you right now riding home from school and you just know she's going to ask you to ride with her down to the park, along Main Street.

Person Pressuring the Friend

You are walking home with Barbara, your best friend, after school. You've just come up with a great idea. If you bicycle quickly down to the park you'll be able to watch the end of the Little League game. But you'll have to hurry. The quickest way to get there is down Main Street. There's always a lot of traffic on Main Street, but if you ride carefully you won't have any trouble. So you say to Barbara, "Let's bike down to the park and see the rest of the Little League game. If we hurry we can make it."

Unsafe Riding

Friend

Your best friend, who is also the star basketball player on your school team, rides home from practice every day (every week, every other day) at breakneck speed, with no regard for traffic lights or stop signs. He rides on the wrong side of the road and pays little attention to where he's going. You're concerned about him because he's your close friend and also because if he gets injured your team will never win the championship. Today's practice is over and you've decided to talk to him about his dangerous bicycle habits. You walk over to his locker where he's changing. What do you say?

Rider

You are the star of the school basketball team and expect the team will win the championship this season behind your leadership. Your other passion is bicycling. You have a ten-speed bicycle that you love to race, even though you know at times you are reckless on it. But you know how to handle a bike with great skill and can take care of any emergency that might arise as your ride. You're changing now in the dressing room, and your best friend and teammate comes over to chat.

Friend

Your best friend, Jose, is always riding his bicycle in dangerous ways, like riding on the wrong side of the street, racing through intersections, red lights, and stop signs, and weaving in between cars. You are both part of a group of kids, and at times all of you are a bit reckless, but Jose is always reckless. The only way you kids can keep up with him is to ride the same reckless way. What bothers you is that you've nearly been in an accident twice and not only are you scared of getting hurt, your parents won't buy you another bicycle if you wreck this one. Then you won't be able to play with Jose at all! Jose has just come over to pick you up for an afternoon of biking, but you've decided to talk to him first about his reckless bicycling habits. What do you say?

Rider

Every weekend and often after school you and your friend, Harvey, go bike riding. You are sort of the leader of the group and you have your reputation to protect as the most daring rider of the group. You know the other kids respect you for this and you like being leader. Besides, you can handle your bicycle better than they can, better than anyone in the neighborhood. You've just biked over to Harvey's to pick him up for today's excitement.

Friend

Your friend Marcia drives her bicycle at night without any lights on it. There is a small reflector on her rear bumper, but you know this isn't enough. Most automobile drivers either can't see it or might hit her by the time they do. This has bothered you for some time now, and you've decided to talk to her about it. You're in a local sandwich shop together having lunch. What do you say?

Rider

You and your friend, Lorrie, are in the local sandwich shop having lunch. Lorrie is a careful sensible person who doesn't do reckless things or take too many chances. You feel she misses out a lot in life by being so careful. Just looking at her right now you can tell she's going to warn you about something, like riding your bike at night with only a reflector or riding on the wrong side of the street.

ACTIVITY #13

Mini-unit Topic: Using Your Bicycle Safely

Approximate Class Time: ½-1 period per exercise

Capsule Activity Description: Students engage in bicycle riding skill development activities that are designed to promote safe riding.*

Objective:

After engaging in three or more of these exercises, students will be able to perform the first of the series of exercises and score higher than the class average on the first round.

Concept Treated:

- Certain skills must be developed to ride a bicycle safely and well.

Materials Needed:

Proficiency progress record forms (Spirit Master #3).

ACTIVITY

Students engage in and evaluate bicycle riding skill development exercises and discuss how they relate to bicycle safety. Sample exercises and instructions are provided at the end of the activity.

Lay out each activity as indicated by the following illustrations on a playground, parking lot, etc. using chalk or masking tape. The measurements are provided with each activity as are the purpose, suggested scoring method, and the nature of the task to be accomplished.

A suggested proficiency progress record form is also provided on Spirit Master #3. This record form and the design of the activities place emphasis upon self-improvement and not on competition between students.

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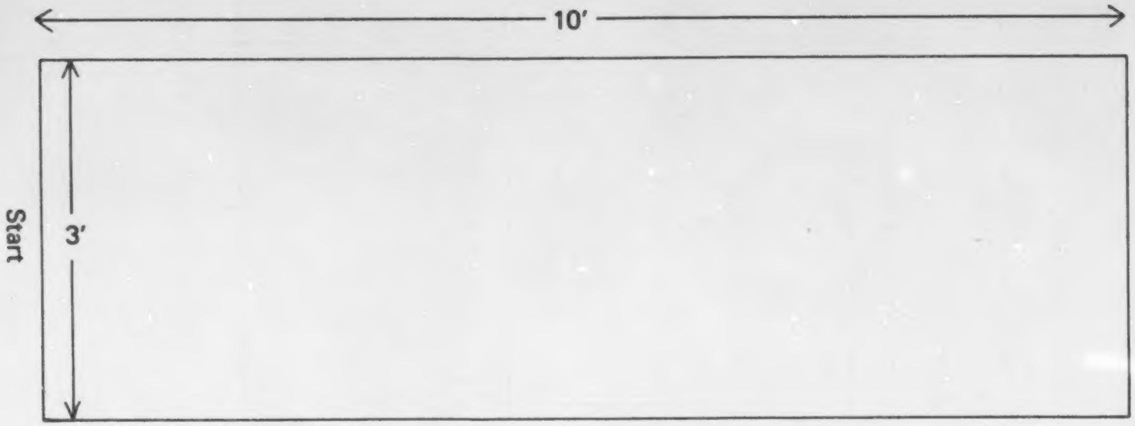
*Exercises and instructions have been taken from the Maryland State Department of Education *Teacher's Guide for Bike Basics*.

The entire series of activities should be made available to the students over an extended period if possible, such as during a free period, in a physical education class, or as an after-school activity in order to allow the students time to become proficient in each exercise.

Students who do not own or have access to bicycles can act as inspectors or timekeepers.

Balance Ability Experience

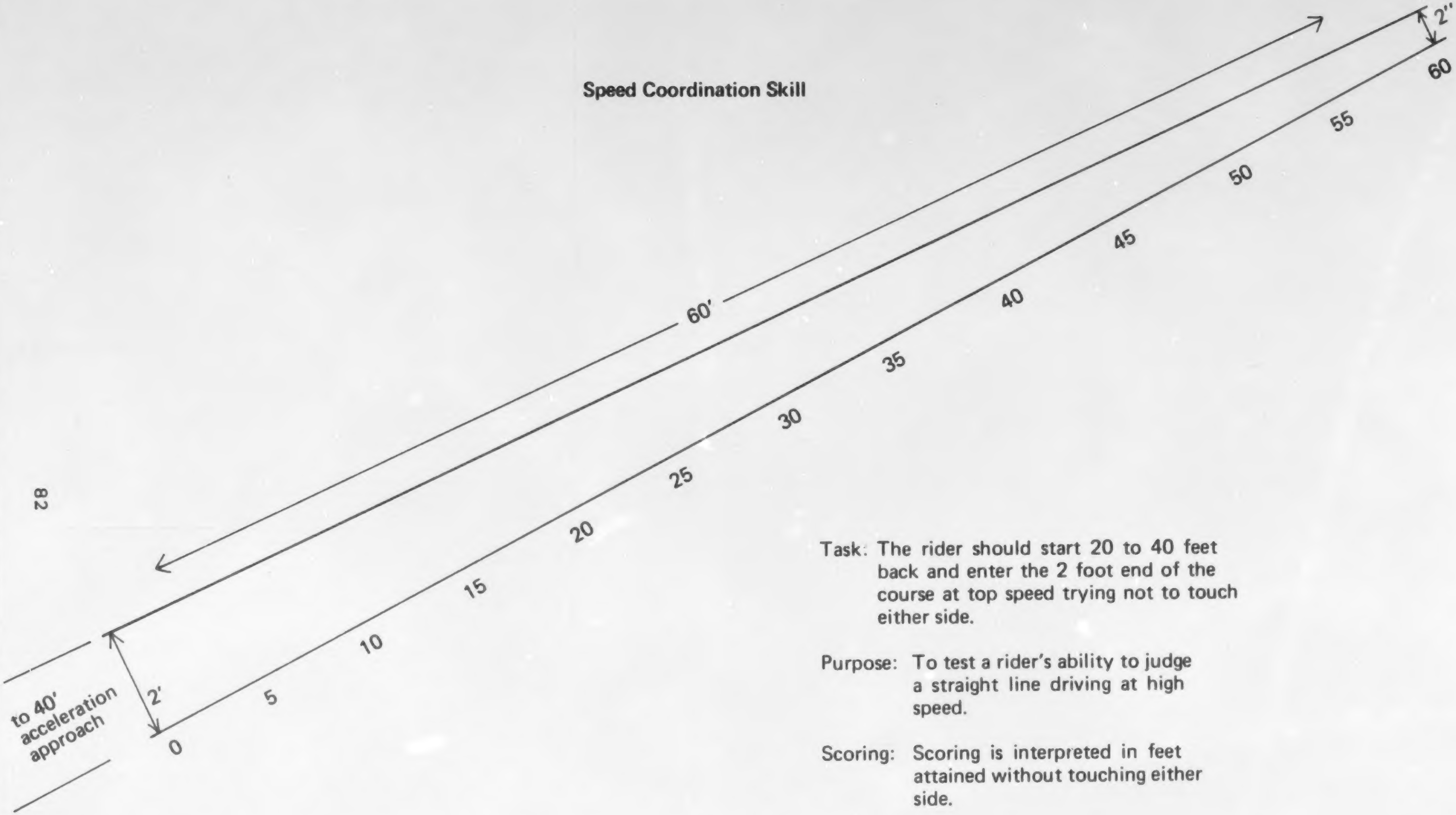


Task: The rider attempts to travel the length of the course, staying in the perimeters, in as much time as he can. (The object is to spend a long time doing this exercise.) All movements must be in a forward direction (no turning around). Feet must remain on the pedals at all times – sitting or standing.

Purpose: To test the balance skill of the rider.

Scoring: Score will be determined by maximum time accumulated in traveling the course.

Speed Coordination Skill

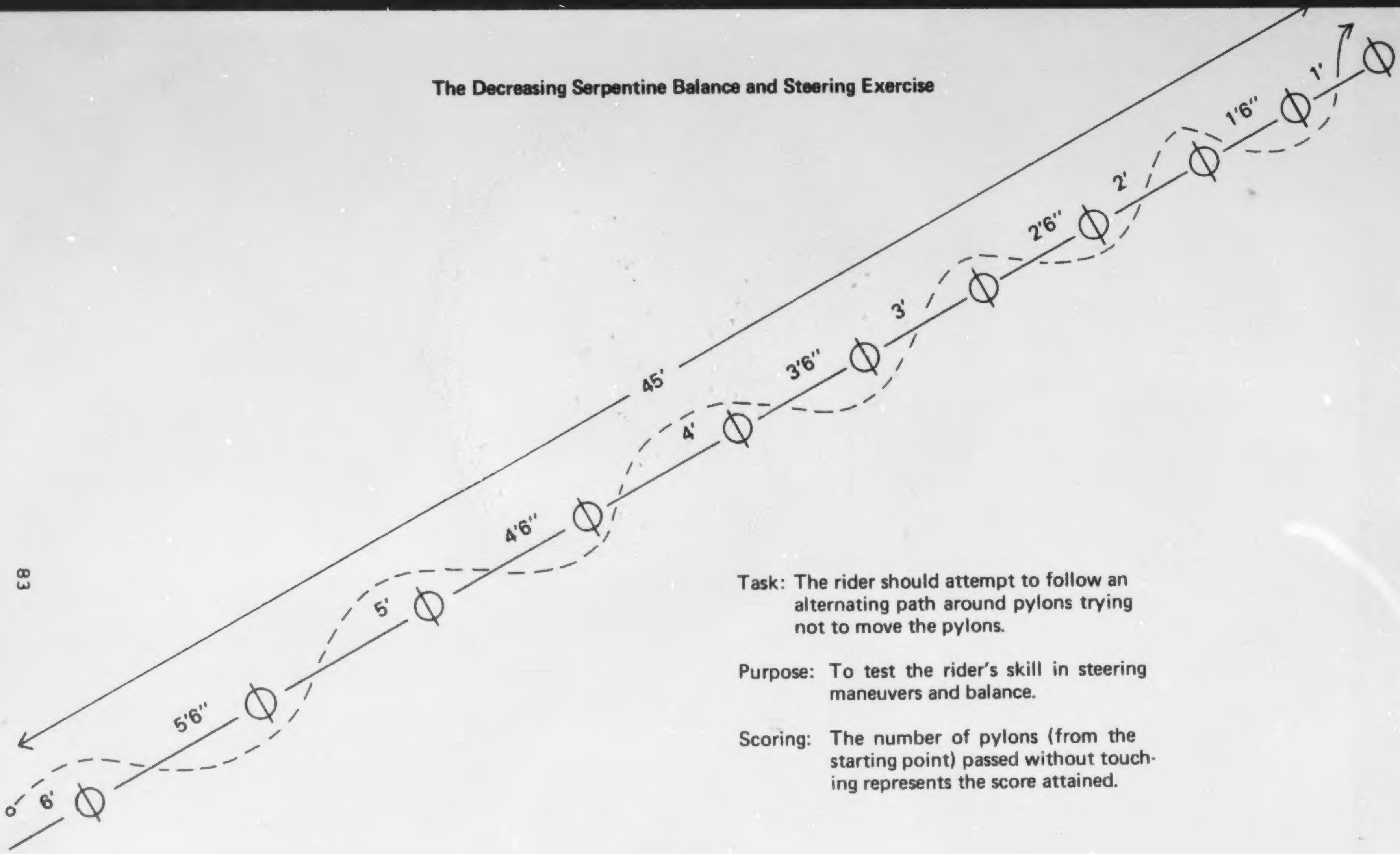

2"
60
55
50
45
40
35
30
25
20
15
10
5
0
60'
2'
to 40'
acceleration
approach

Task: The rider should start 20 to 40 feet back and enter the 2 foot end of the course at top speed trying not to touch either side.

Purpose: To test a rider's ability to judge a straight line driving at high speed.

Scoring: Scoring is interpreted in feet attained without touching either side.

The Decreasing Serpentine Balance and Steering Exercise

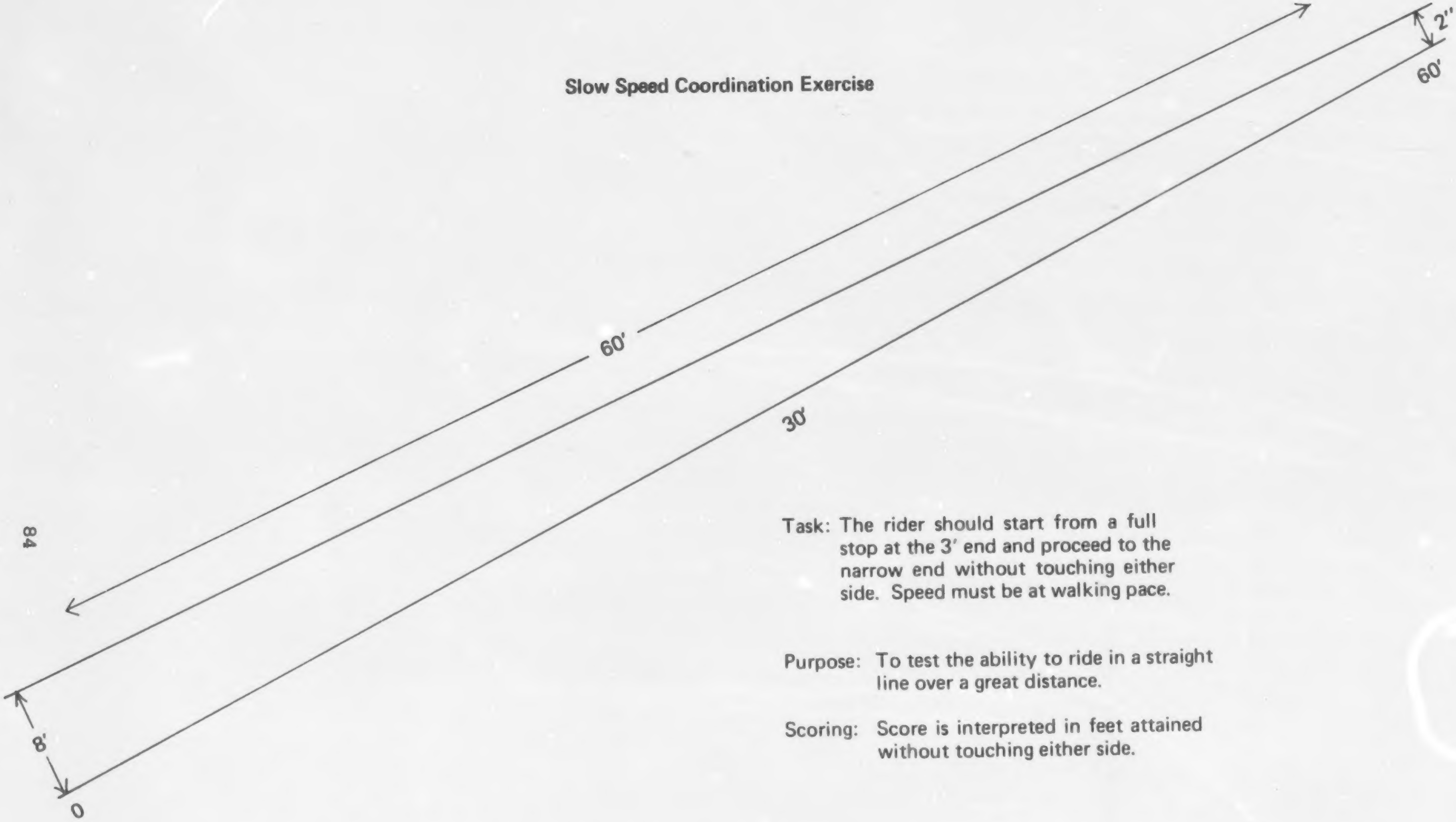


Task: The rider should attempt to follow an alternating path around pylons trying not to move the pylons.

Purpose: To test the rider's skill in steering maneuvers and balance.

Scoring: The number of pylons (from the starting point) passed without touching represents the score attained.

Slow Speed Coordination Exercise

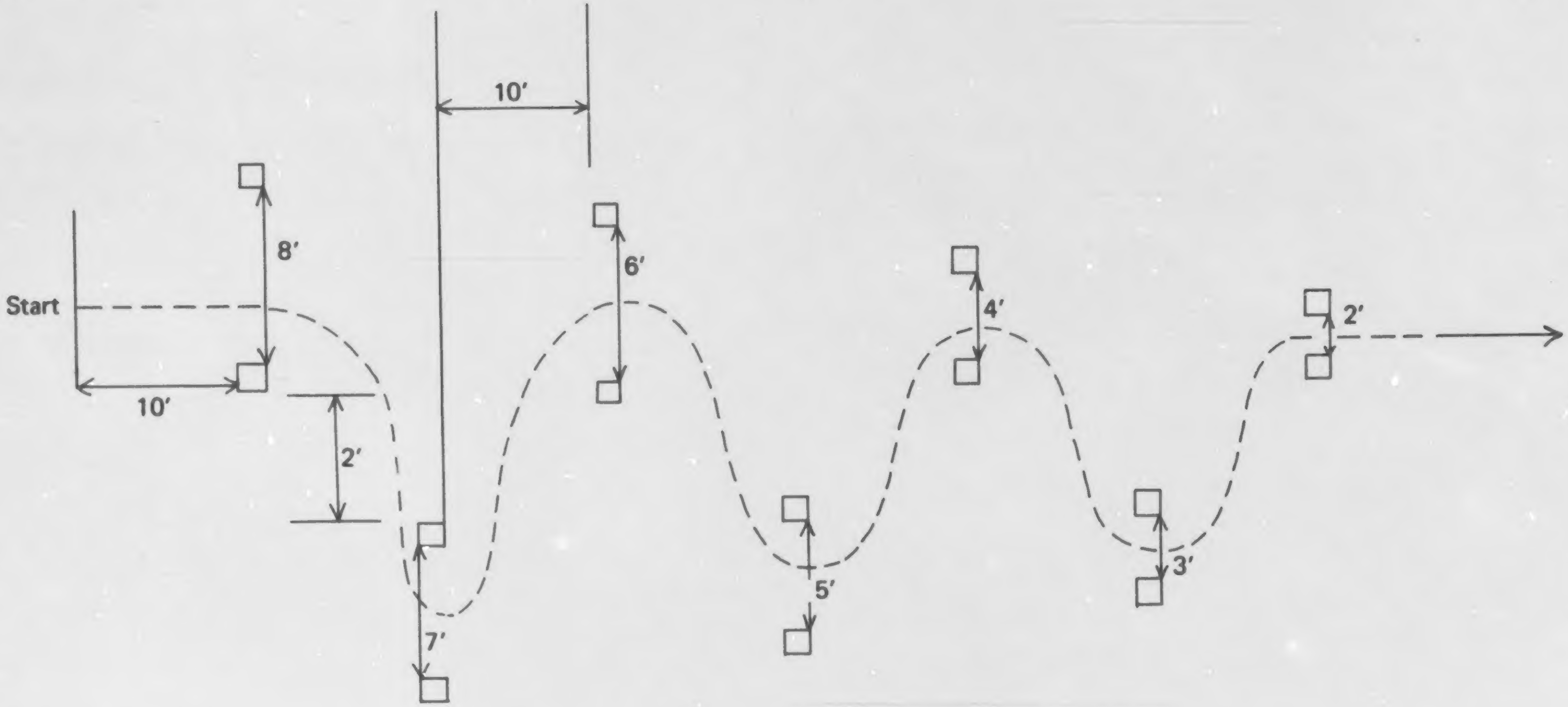


Task: The rider should start from a full stop at the 3' end and proceed to the narrow end without touching either side. Speed must be at walking pace.

Purpose: To test the ability to ride in a straight line over a great distance.

Scoring: Score is interpreted in feet attained without touching either side.

Decreasing Space Maneuvering Exercise

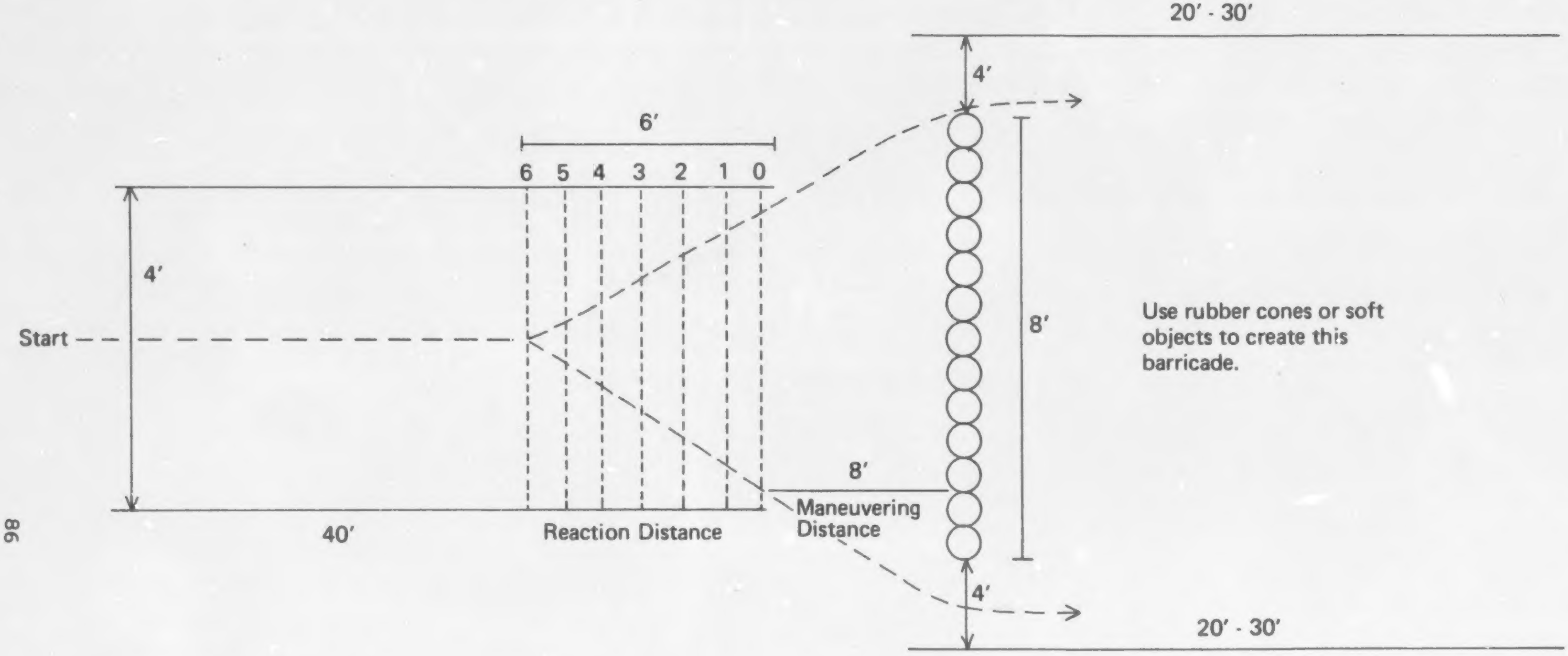


Task: Driving at a slow rate of speed, the rider must put both wheels through each pair of obstacles without his or her tires touching the obstacles and without his or her feet touching the ground.

Purpose: To increase the rider's ability to gauge space and distance.

Scoring: Score is determined by the number of obstacles successfully passed.

Right or Left Evasion Exercise



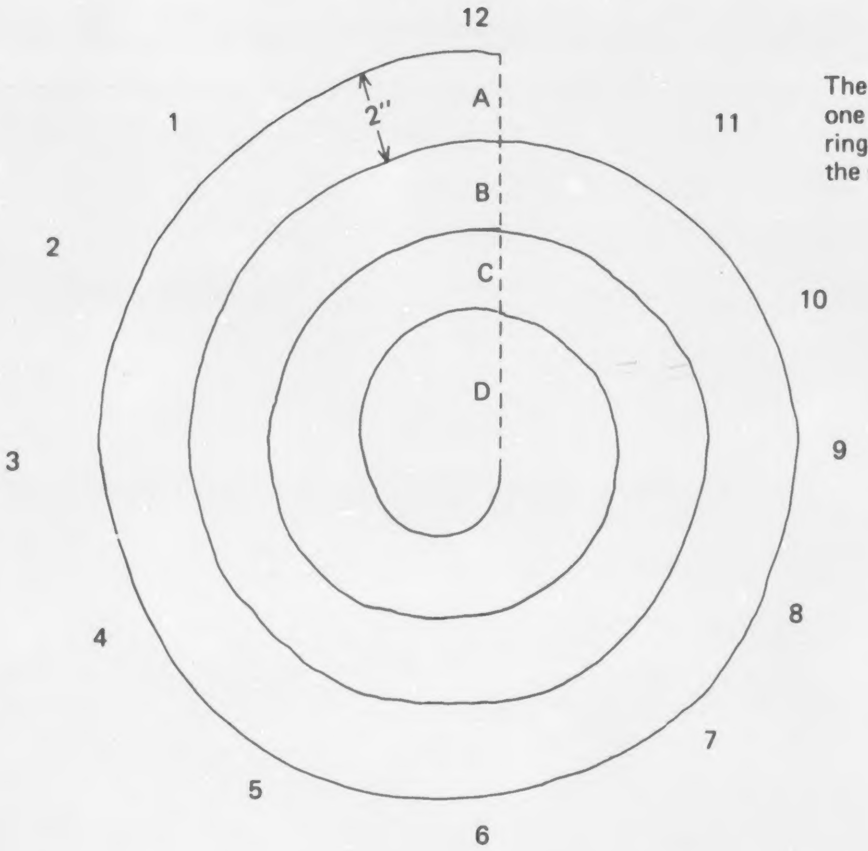
Use rubber cones or soft objects to create this barricade.

Task: The rider should drive his or her bicycle at a very fast pace toward the center barricade line. When the rider reaches a pre-selected line, a judge gives the command right or left. The rider must maneuver his or her bicycle in that direction without hitting the barricade or going over any lines. If the child successfully maneuvers his or her bicycle through the obstacle course, the judge moves to the next shorter reaction distance line.

Purpose: To test the bicycle rider's skill in interpreting and reacting to a sudden situation.

Scoring: Score is interpreted in terms of reaction distance needed to maneuver through the course. Feet of reaction distance successfully completed would be the score. (0 would be an excellent score.) Difficulty may be changed by adding or subtracting the reaction distance and the maneuvering space.

Left Spiral Exercise



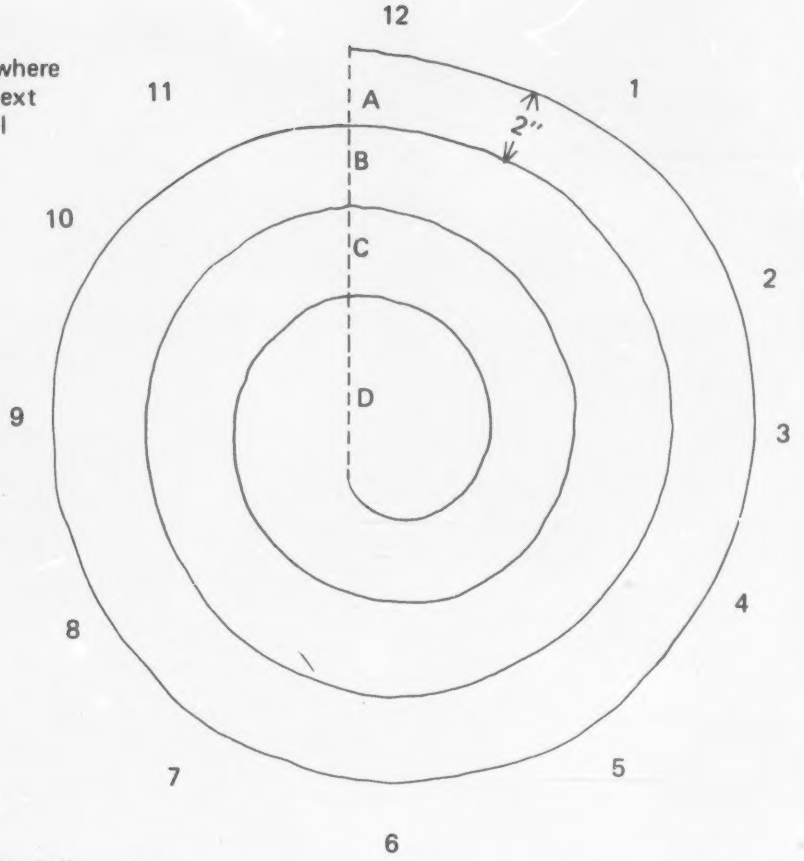
The dotted line shows where one ring ends and the next ring begins as you travel around the spiral.

Task: The rider should follow the spiral path to the center without touching any boundary lines.

Purpose: To develop a bicycle rider's left turning skill and balance.

Scoring: Score is determined by a clock number (counterclockwise) and by a lettered ring. The score is taken from the distance reached at the point the first line is touched. For example, a score of C-9 would say the child touched his first line in Ring C and at 9 o' clock. Each lettered ring represents one complete circle to the next ring. 12 o'clock represents a transition to the next ring.

Right Spiral Exercise



The dotted line shows where one ring ends and the next ring begins as you travel around the spiral.

Task: The rider should follow the spiral path to the center without touching any boundary lines.

Purpose: To develop a bicycle rider's right turning skill and balance.

Scoring: Score is determined by a clock number and by a lettered ring. The score is taken from the distance reached at the point the first line is touched. For example, a score of C-9 would say the child touched his first line in Ring C and at 9 o'clock. Each lettered ring represents one complete circle to the next ring. 12 o'clock represents a transition to the next ring.

SUPPLEMENTARY ACTIVITIES

Activities 14 and 15 which follow can be used either in conjunction with one of the mini-units or individually, by themselves.

Activity #16, the last activity, suggests quiz questions you can use after teaching one or more of the mini-units or individual activities.

ACTIVITY #14

Supplementary Activity Approximate Class Time: 1 period

Capsule Activity Description: Students play a card game that requires them to distinguish between safe and unsafe bicycle riding.

Objective:
By the end of the activity students will be able to determine if the behavior illustrated on any ten playing cards is safe or unsafe.

Concept Treated:

- There are specific behaviors one must observe for safe bicycle riding.

Materials Needed:
Game cards (attached).

ACTIVITY

Students play a card game that requires them to distinguish between safe and unsafe riding. The class breaks into small groups of no more than four students. Students are given or read the playing instructions on the following two pages. Each group is then given a duplicated copy of the game cards which follow the instructions and cuts them out and pastes them onto cardboard for durability. Then review the game instructions once more. (Correct answers of "Safe" and "Unsafe" for the cards may be found following the game cards.) Students need to have studied the rudiments of safe bicycling prior to playing this game.

Game Instructions

The game is played along the lines of gin rummy, with certain exceptions noted below. There are 45 cards. Some describe safe and others unsafe things to do on a bicycle. The cards are numbered 1, 2, or 3. The object of the game is to decide which cards are safe and unsafe and to group cards in series of three based on this difference. The winner is the player who has melded the most cards when the entire deck has been used. Playing instructions follow.

1. Game can be played by 2 - 4 students. If only two students play, use half the deck.

2. To determine who goes first each player picks one card at random; player with card having the largest number in the bottom right-hand corner. Play proceeds clockwise.

3. Shuffle the cards and deal out six cards to each player. Place the rest of the deck face down. Turn top card face up placing it next to the deck to form a discard pile.

4. First player has two choices: he may select the card that is face up or take a card from the top of the deck.

   - If he select the one that is face up, he must make a group. In fact, anytime a player picks a card from the discard pile of face up cards, he must meld. He then discards one card face up onto the discard pile.

   - If the player takes the card from the top of the deck, he may either retain that card or discard it. If he retains it, he must discard another card.

5. Other players take their turns until there are no more cards in the deck.

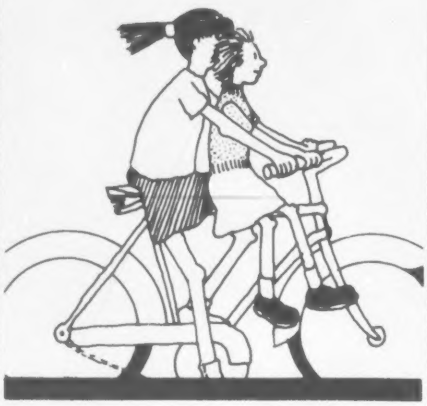
6. The purpose of the game is to meld as many cards as you can. The player who melds the most cards by the time the deck is gone wins.

7. Players may meld only when it is their turn. *All groups must have all safe or all unsafe cards, no mixtures of safe and unsafe.* Cards can be grouped that are numbered 1, 2, 3 in a row or have the same number (1, 1, 1; 2, 2, 2; or 3, 3, 3). Three cards must be included in each group.

8. Players may not add to groups of other players, as they can in gin rummy.

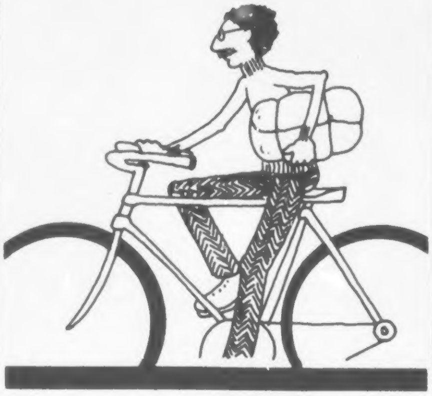
9. If a player makes a meld that is a mixture of safe and unsafe cards, he may be challenged by any other player. If the challenger is correct (decided by consulting the answer key), he is given the melded cards to

use as he wants: he may keep them in his hand, discard them, or keep some and discard others. If the challenger is wrong, he must let the challenged player pick any two cards at random from his hand. The challenged player may keep or discard these two cards.



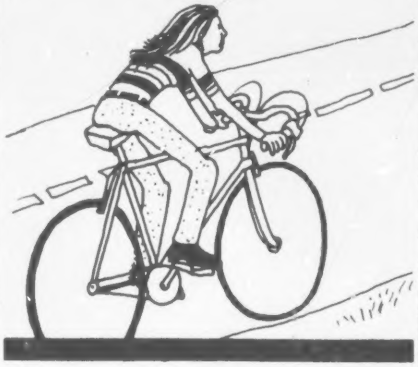
1 Carrying someone sidesaddle

1



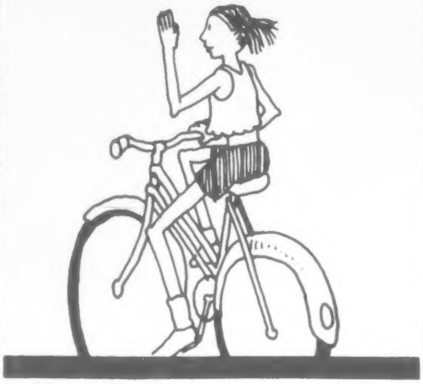
2 Carrying a package under one arm

2



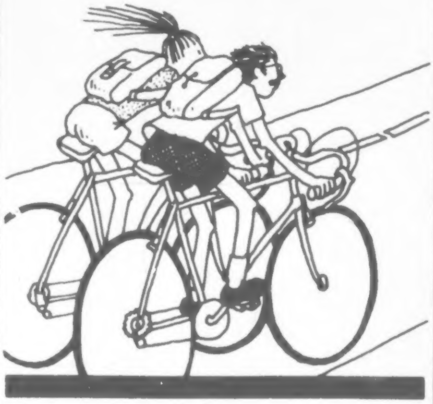
1 Riding on the right-hand side of the road

3



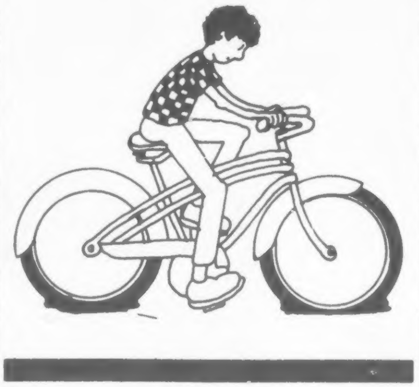
2 Signaling a right-hand turn

4



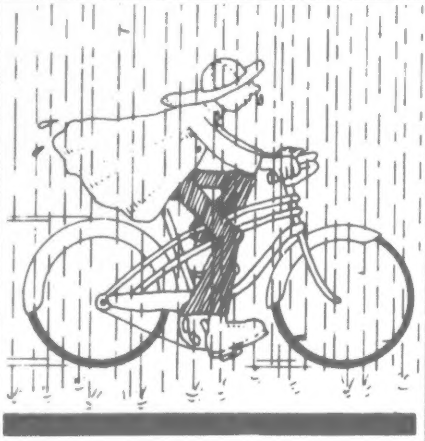
3 Riding next to each other on roads and streets

5



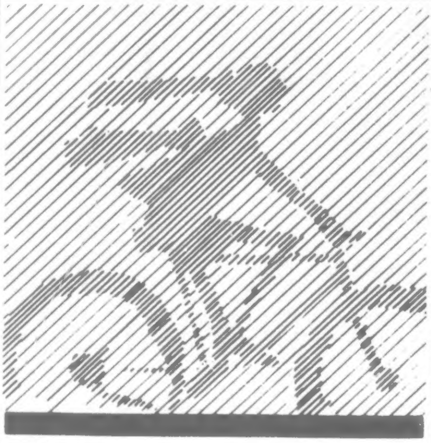
1 Riding with soft or flat tires

6



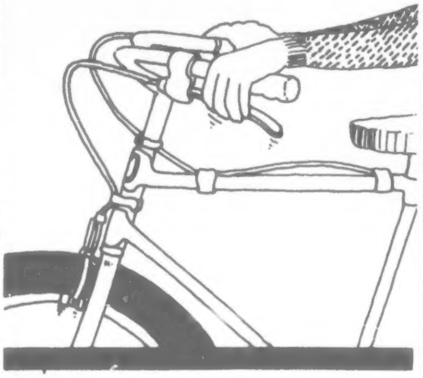
2 Not slowing down when riding in the rain

7



3 Riding at night without lights

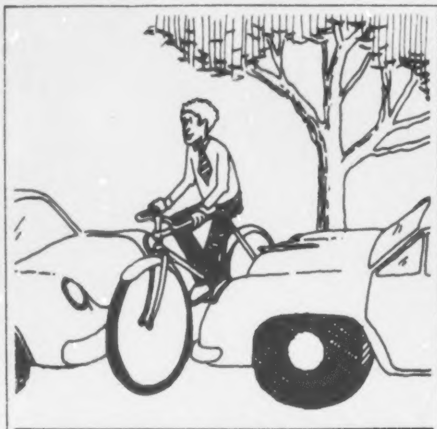
8



3 Checking brakes to see if they work

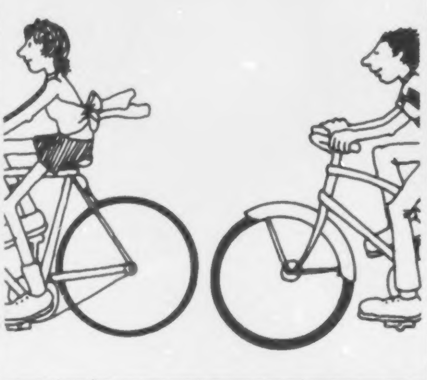
9

Cut along thin lines



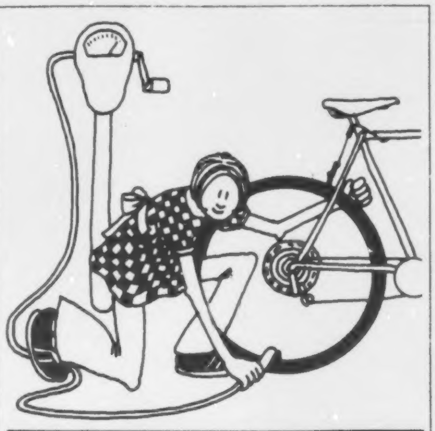
2 Riding into street from between parked cars

10



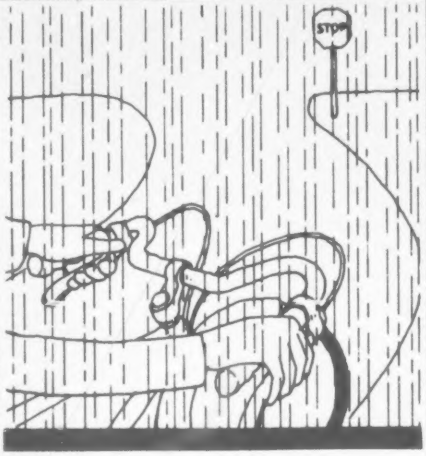
1 Riding behind or in front of your friends bike on roads and streets

11



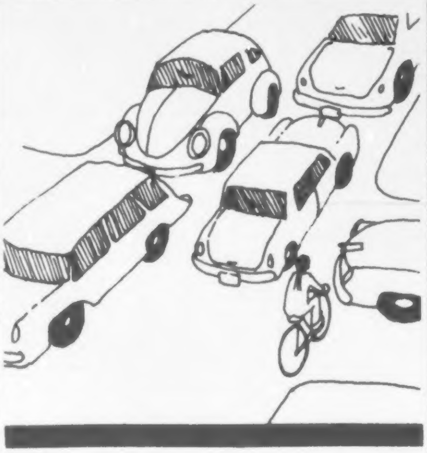
2 Checking the air in your tires

12



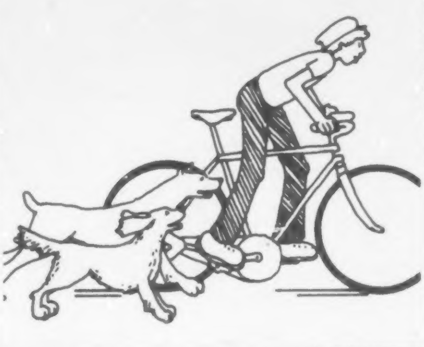
3 Using your brakes sooner when it rains

13



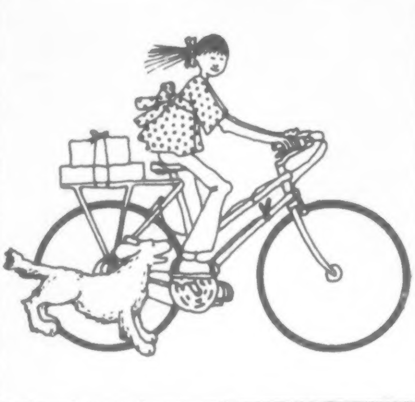
3 Riding across busy cross-roads and intersections

14



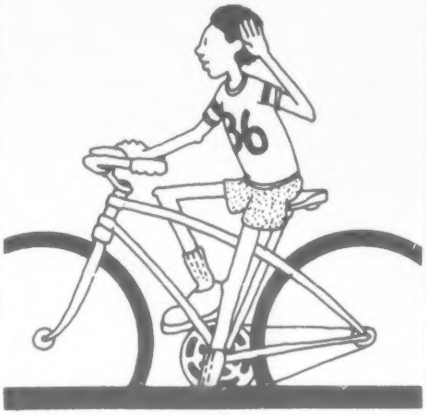
1 Speeding up to avoid dogs

15



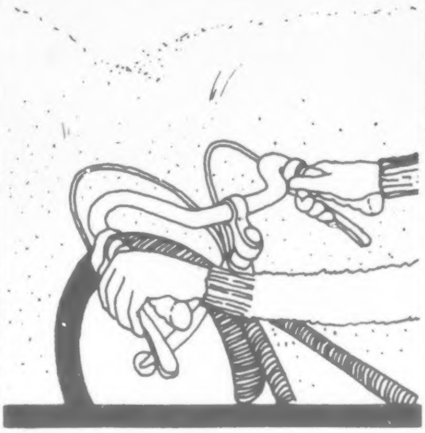
1 Slowing down when chased by dog

16



2 Listening for cars behind you

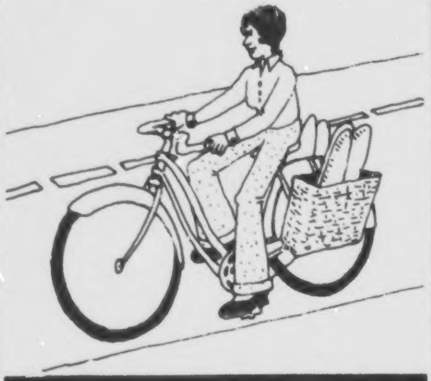
17



3 Slowing down in sand

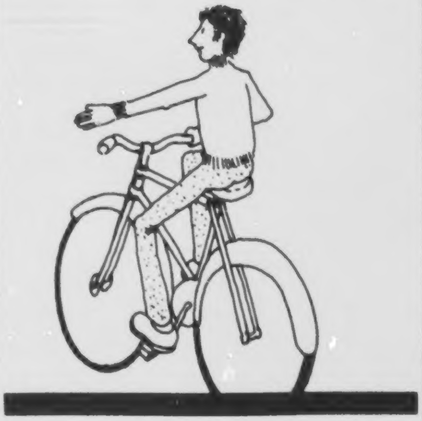
18

Cut along thin lines



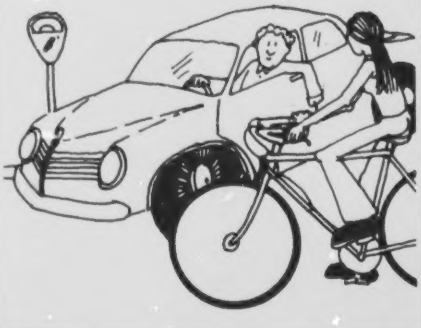
1 Riding on the left-hand side of the road

19



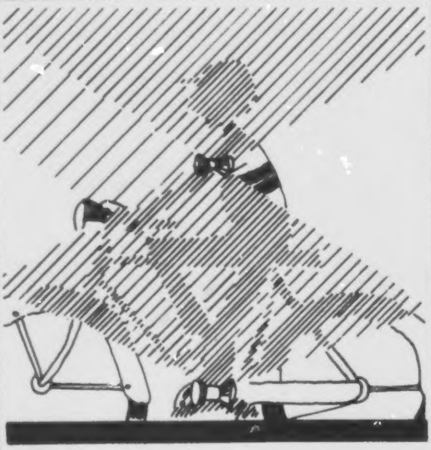
1 Signaling a left-hand turn

20



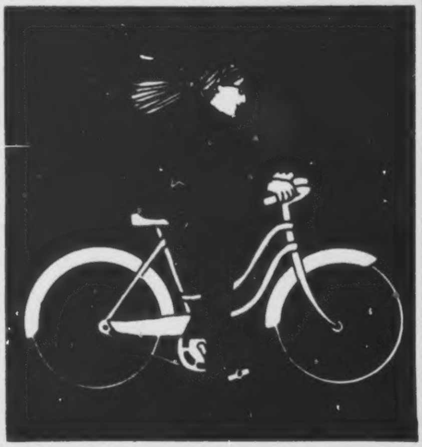
2 Looking for parked cars to pull out

21



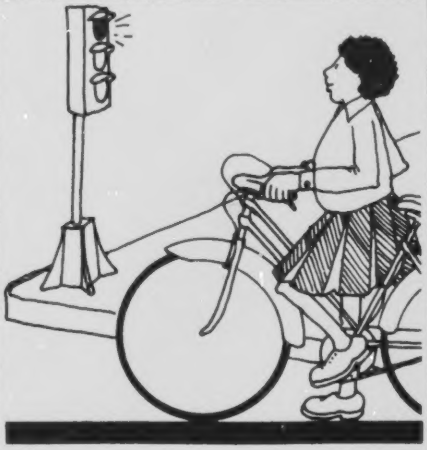
3 Riding at night with lights

22



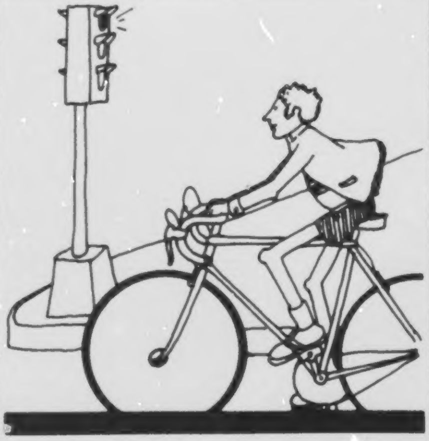
2 Wearing dark clothing at night

23



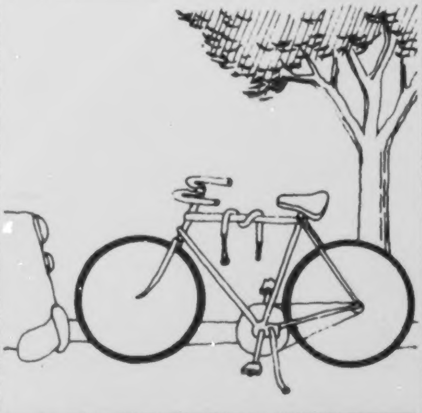
1 Stopping for red lights

24



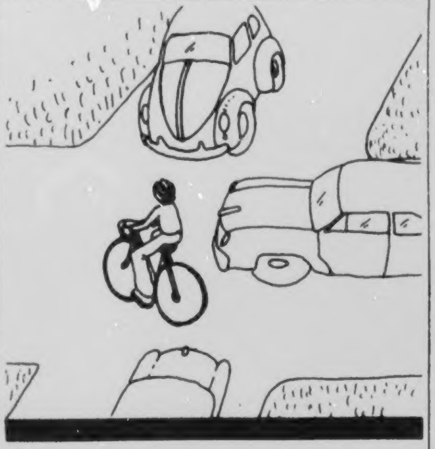
Not stopping for red lights

25



1 Parking your bicycle in the street

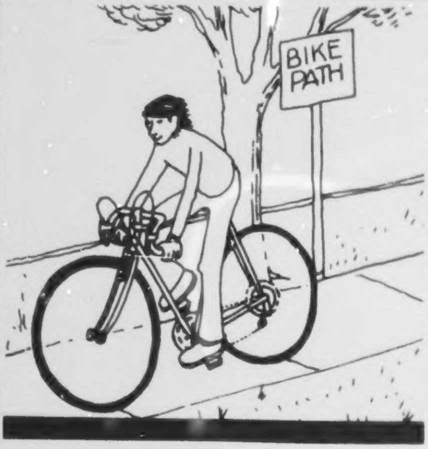
26



2 Not signaling when making a turn

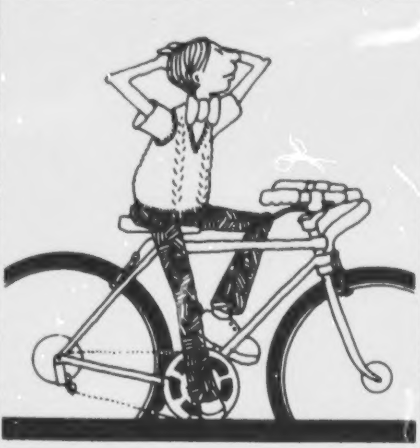
27

Cut along thin lines



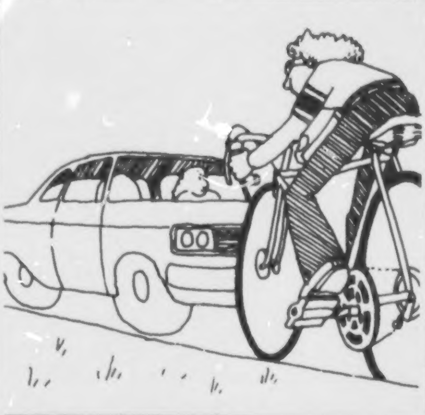
1 Riding on the sidewalk when its legal

28



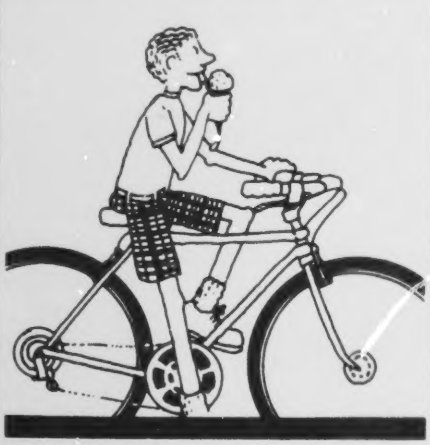
1 Riding without both hands on the handlebars

29



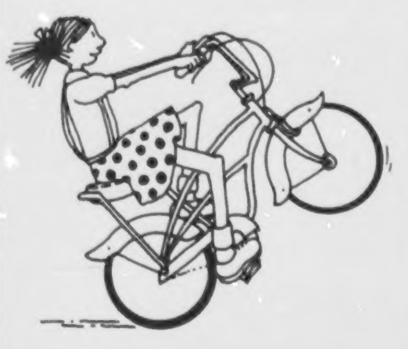
2 Riding toward the traffic

30



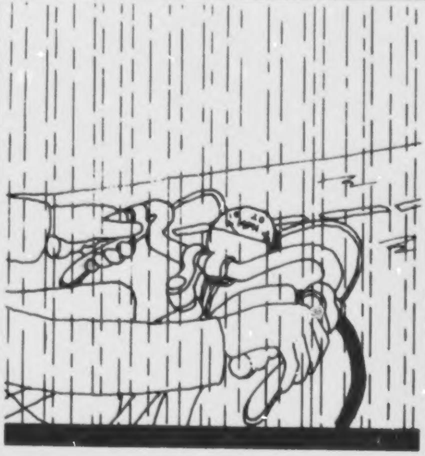
3 Riding with one hand on the handlebars

31



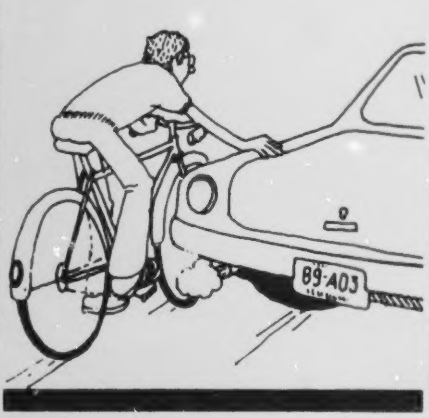
1 "Popping a Wheelie" (riding with one wheel off the ground)

32



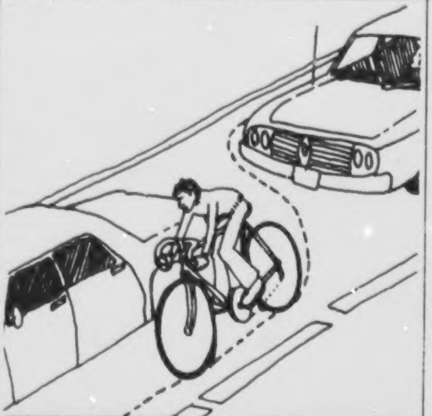
2 Riding more slowly in the rain

33



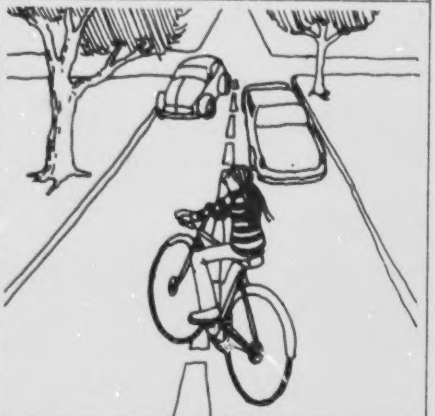
2 Hitching a ride by holding onto a moving car

34



3 Weaving in and out

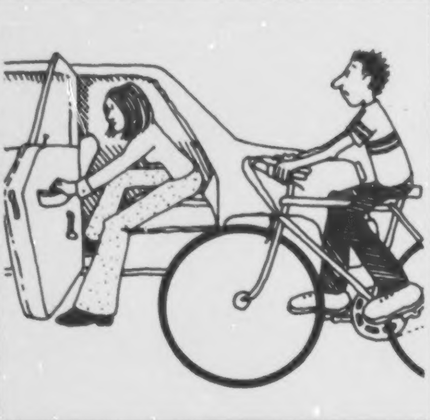
35



1 Crossing in the middle of the street

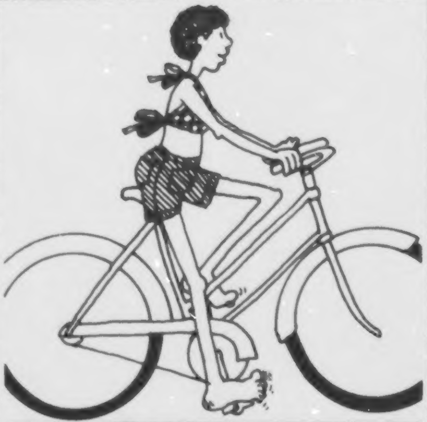
36

Cut along thin lines



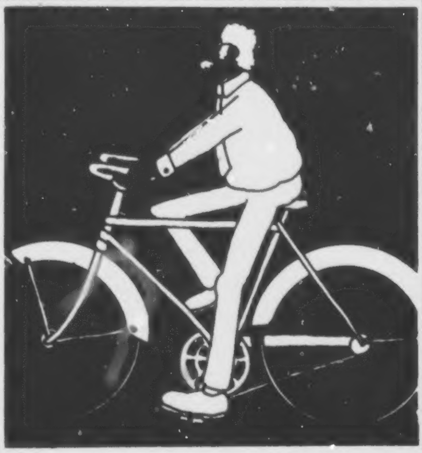
2 Looking for parked cars to suddenly open their doors

37



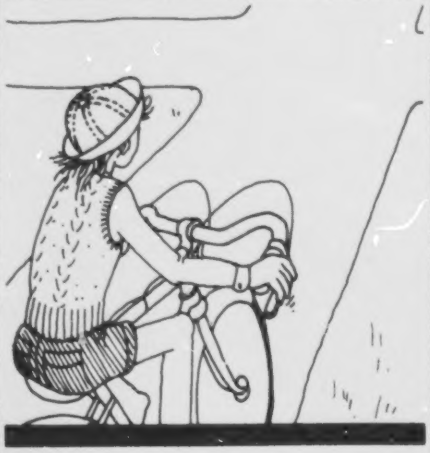
3 Riding barefooted

38



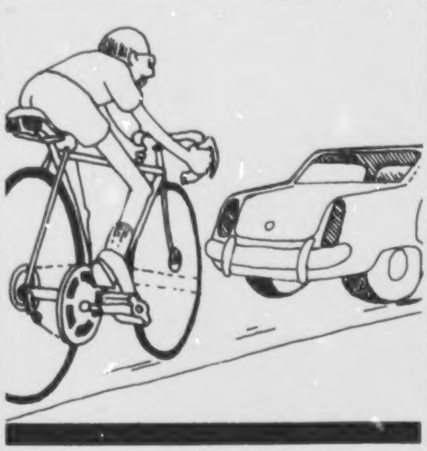
3 Wearing light-colored clothing at night

39



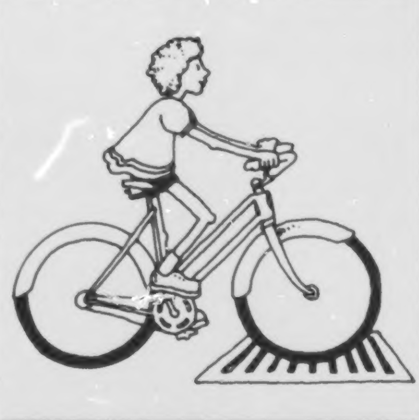
1 Slowing down at crossroads

40



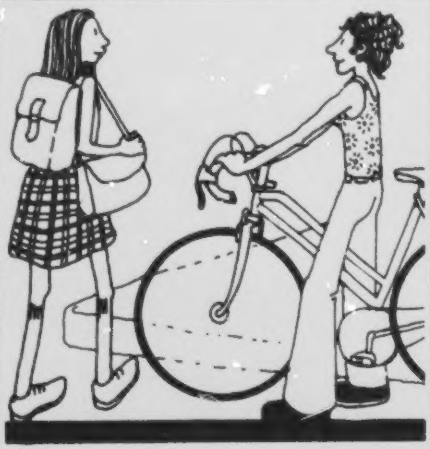
2 Riding with the traffic

41



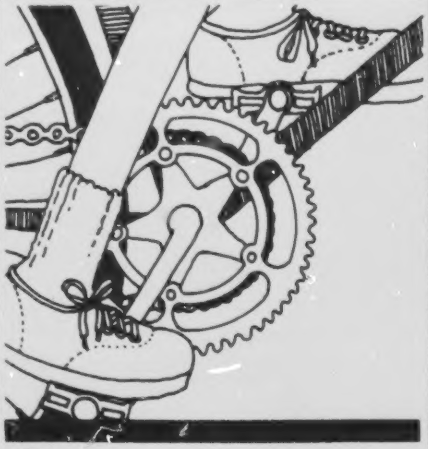
3 Riding vertically across a grate

42



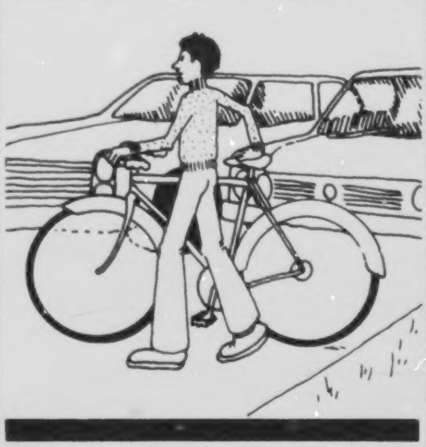
1 Stopping for pedestrians

43



2 Riding wearing shoes or sneakers

44



3 Walking your bike across a busy street

45

Cut along thin lines

Answer Key

1. Unsafe
2. Unsafe
3. Safe
4. Safe
5. Unsafe
6. Unsafe
7. Unsafe
8. Unsafe
9. Safe
10. Unsafe
11. Safe
12. Safe
13. Safe
14. Unsafe
15. Unsafe
16. Safe
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34. Unsafe
35. Unsafe
36. Unsafe
37. Safe
38. Unsafe
39. Safe
40. Safe
41. Safe
42. Safe
43. Safe
44. Safe
45. Safe

Note: Playing card numbers are found in bottom right-hand corner of cards.

ACTIVITY #15

Supplementary Activity

Approximate Class Time: ½-1 period per race or game

Capsule Activity Description: Students engage in bicycle games and races.

Objective:

After engaging in three or more of these games or races students will be able to name at least two things they can do to be better and safer bicyclists.

Concepts Treated:

- There are many ways to use a bicycle.
- It takes coordination and skill to ride a bicycle well.

Materials Needed:

See individual games and races.

ACTIVITY

Students engage in one or more of the bicycle games and races which are described below.

Bike Games and Races*

Slow or Snail Ride

The object of this funny game is to see which rider can travel slowest. The last rider to cross the finish line wins. Any type of bicycle can be used.

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*Reprinted from *Guide for Leaders: 4-H Bicycle Program,* U.S. Department of Agriculture, Extension Service, Washington, DC 20250

Lay out a course 50 to 100 feet long with several lanes 3 to 6 feet wide. Assign a lane to each rider. Run several heats if necessary.

At a signal, each rider gets underway at the starting point, riding as slowly as possible. Disqualify any rider who does not stay in his lane, who touches a foot to the ground, or who turns around. Appoint a referee to be sure rules are obeyed.

The last rider to cross the finish line is the winner. If several heats are run, have winners "race" in a run-off.

Grab Bag

A variation of musical chairs, this game is played by having playground equipment or other objects suspended from ropes. Riders grab the objects while their bikes are in motion. Those who fail to grab objects when the stop signal is given must drop out. The rider remaining in the game longest wins.

Large balls or other objects lying on the ground can also be used in a pick-up version of the game. Confine the riders within definite boundaries.

Pick and Put

This game is designed to develop sprint techniques and the ability to mount and dismount a bicycle quickly. It requires two goals at least 50 feet apart.

Choose two teams with an even number of riders on each. Select ten or fewer small objects--potatoes, empty cans, stones, rubber balls--which a rider can carry in one hand.

Draw two 2-foot circles side-by-side at each end of the course. Place half the small objects in one circle at one end, the others in one circle at the other end.

Object of the game is to transfer all objects in one circle to the empty circle at the opposite end before the opposing rider can do the same thing. Only one object is carried at a time.

Teams line up at opposite ends. At a signal, one member of each team mounts his bike and rides to the other end, dismounts and picks up an object from the circle. He then remounts and rides back to the starting point, dismounts and places the object in the empty circle. He continues this routine until all objects from the other end have been transferred to his team's end.

The rider who finishes first earns 10 points for his side. In case of a tie, points are split. If a rider drops the objects enroute, he is disqualified and the other team scores. If riders collide or if one becomes dismounted but retains his object, riders may remount and continue the game.

The game continues until all riders have completed the course. Highest scoring team wins.

Paul Revere

This is a speed test. Select two teams with the same number of riders on each side. Have them line up astride their bikes and ride clockwise around both lines and back to their starting points. The rider arriving last drops out of the game.

Players count off from right to left. When the leader calls off a number, the two players with that number mount their bikes and ride clockwise around both lines and back to their starting points. The rider arriving last drops out of the game.

After all numbers have been called, the team with the most riders left wins.

Shipwrecked

Select a large playground or parking lot. Line up all players on one side, side-by-side facing the center of the lot. Place a large piece of paper, sandbag, or other target made of something soft and harmless in the open area.

Each player in turn rides forward, is blindfolded, and rides out to mark the target. Other players on bikes surround her at a safe distance and clap their hands when she gets warm, reducing their clapping as she goes away from the target. When she thinks she has reached the target, the blindfolded rider gets off her bike and marks the spot with a stick or other marker.

The rider who comes closest to the target wins the game.

Hitting the Target

This game requires skill and good coordination. Set out four to six coffee cans, bowls, or other receptacles in a row about 15 feet apart along a 100-foot course. If the ground is soft, press the containers into the ground with open end up.

Give each rider a supply of marbles, bottlecaps, small stones, or similar objects. Contestants then ride along the course dropping a marker in each can. Award one point for each hit.

A variation of this game is to number each rider and each can. Each rider is required to drop his marker in the can with his number on it. Riders who miss their cans are eliminated. Repeat the course until only one rider is left as the winner.

Spud

This game is played in a large open area with a softball or volleyball. One player becomes "it" and stands with his bike and the ball in the center of a circle. The other players ride their bikes around the circle until "it" calls one of their names and tosses the ball into the air.

The player whose name is called rides for the ball, dismounts and picks it up. Meanwhile, the other riders scatter, including "it."

When the person called has retrieved the ball, she yells, "Halt," and all riders must stop immediately, straddling their bikes. The player with the ball returns to the center of the circle and attempts to hit one of the other bikes by rolling the ball at it. Riders cannot move themselves or their bikes, and thrower cannot move away from center of the circle. If thrower misses bike, one dud is counted against her and she becomes "it." If she hits the bike with the ball, the player gets one dud and become "it."

When a player gets three duds, she is disqualified or penalized in some manner.

Pursuit Race

This is an elimination race determined by speed. Line up all contestants about 3 feet apart at the starting line. Start the race with a whistle or other signal.

Object of the race is to pass the leader. As the leader is passed by another rider, he must drop out. This continues until only one rider is left and he crosses the finish line.

Mixed Distance Race

This is a relay race with each team member riding a different number of laps. It is most interesting when the distances are mixed with fewer laps coming at either end or as sprint laps.

As a contestant completes her required number of laps, she passes a baton or touches the hand of her successor. The team that finishes first is the winner.

Reds and Whites

Select two teams, "Reds" and "Whites." Lay out a 200-foot field with a center line, two lines 10 feet back from the center on each side and end lines 100 feet from the center.

Players line up five feet apart on their own lines 10 feet back of the center line. Teams face each other.

A starter stands at the end of the center lines and tosses a red and white disc. He calls the side that comes up. The players on the side not called mount their bikes, turn around and ride as fast as possible to their own back "safety" lines. The team whose color is called mounts and chases them, tagging as many of the other team as possible before they cross the safety line.

Those tagged become members of the other team. The winning team is the one with the most players after a limited number of tosses of the disc.

Ride, Sheep, Ride

Divide riders into two teams, "Sheep" and "Hunters," and select a home base. While the Hunters close their eyes or remain indoors, the Sheep and their leader ride out to hide. They agree on a set of signals to be called by their leader. These might include short or long horn blasts, a whistle, or special words such as "Indians" or "Cowboys" meaning "lie low," "move up toward base," "get ready to ride for home" or other commands.

When all Sheep have been hidden, the leader returns to home base and rides out with the Hunters. She calls signals as appropriate to keep her team from being discovered. When she thinks the Hunters are off guard or far enough away, she yells, "Ride, Sheep, Ride."

At this signal the Sheep emerge from their hiding places and ride fast for home base. Hunters also race for home. The full team that arrives home first wins. This team is the "Sheep" for the next game.

If cover is not plentiful, it may be necessary to divide your group into several teams of "Sheep" and "Hunters" with different home bases.

Tug-O-War

This is a game of team strength and endurance. Stretch a long rope on a level surface, tie a handkerchief in the middle, and put out markers or stakes four yards apart.

Line up the two teams on opposite sides of the markers with the rope stretched between them so that the handkerchief is midway between the two markers. Riders face away from the middle. Each player grasps the rope with one hand. At the command, "Ready," he mounts his bike and establishes balance by a slight, even pull on the rope. On the command, "Go," all riders pedal hard and pull on a rope.

Object is to pull the handkerchief past the marker on your side. If a rider's body or foot touches the ground, he is disqualified and the game continues without him.

Run and Ride Race

Contestants in this race start by either riding or running beside their bikes for a given distance. They then change to the opposite, alternating as often as desirable until they complete the course.

Simple Relay Race

Line up teams in single file behind starting line. At the signal, first player on each team rides out to goal 100 feet away, turns around and rides back, touching off second rider. He then takes his place at rear. Players move up to starting line as their turn approaches. Winner is team whose last player returns to starting line first.

Plank Riding Race

Lay out a series of wooden planks, 5 to 6 inches wide, for a distance of at least 150 feet. Contestants try to ride the entire distance without running off the planks. The rider who completes the course in the fastest time with the fewest slips off the planks is the winner.

Potato Relay

Obtain four to six potatoes for each team. Place potatoes in a box or basket at the starting point for each team. Mark off a series of circles 5 yards apart in front of the box.

Start the game with all potatoes (blocks, stones, etc.) in the box. First rider takes one potato, places it in first circle, and returns to the starting point. Second rider takes second potato and places it in second circle. Repeat until all potatoes have been placed in circles. Then reverse procedure, retrieving one potato at a time. Team that finishes first wins.

Game can be varied by having one player on each team place all potatoes before second player takes his turn. Game can also be reversed with all potatoes placed in circles at beginning and retrieved and replaced one by one.

If only a few players are available, game can be played as race against time with fastest player declared winner.

Dizzy Relay

Place round poles or other objects players can ride around from 50 to 100 feet in front of starting point. Line up teams in single file.

At signal, first rider on each team rides to goal and circles it at least three times. If pole is used, she keeps one hand on it as she rides around. She then returns to base and tags next rider on her team who repeats procedure. Team finishing first wins game.

Files should be at least 10 feet apart and all riders should circle poles in same direction to avoid collisions.

ACTIVITY #16

Supplementary Activity Approximate Class Time: ½-1 period

Capsule Activity Description: Students answer questions on bicycles and bicycle safety.

Objective:
To evaluate what students have learned during their study of bicycles.

ACTIVITY

A series of questions follows on bicycles and bicycle safety. You will want to choose only those questions which treat bicycle topics which your students have studied.

These quiz questions can be used to evaluate a mini-unit or to supplement the evaluation method included in the objectives statement at the beginning of each activity.

1. Name two good things about owning or using a bicycle.

   (a) ____

   (b) ____

2. Name two bad things about owning or using a bicycle.

   (a) ____

   (b) ____

3. There are four steps to buying a bicycle. Here are two of them. What are the other two?

   (a) ____

   (b) Deciding where to buy the bike

   (c) Buying the bike

   (d) ____

4. When you lock your bike you should pass the chain through both the wheels and the frame and lock the bike to a solid object. (Circle true or false.)

   True False

5. A bicycle should not need any maintenance as long as you ride it carefully. (Circle true or false.)

   True False

6. Read each sentence. Decide if what it says is safe or unsafe. Circle the right answer.

(a)	Speed up if a dog starts to chase you on your bicycle.	Safe	Unsafe
(b)	Wear light colored clothing when you ride at night.	Safe	Unsafe
(c)	Check the air in your tires regularly.	Safe	Unsafe
(d)	People should ride their bikes on the left-hand side of the street.	Safe	Unsafe
(e)	As long as you check the traffic you don't have to stop for stop signs.	Safe	Unsafe

7. Pretend you are a parent. You have just caught your daughter for the third time riding her bike at night without a light. You told her she could not ride it at night until she bought a light. She has been saving her allowance for weeks and almost has enough money to buy one. You hate to punish her, but she was doing something that you think is dangerous. What do you say to her? Do you punish her? If so, how?

8. If you wipe your bike dry when it is wet your bike will (circle the correct answer)

   (a) Probably get stolen

   (b) Last longer

   (c) Rust

9. By making sure your brakes are working you will (circle the correct answer)

   (a) Be safer

   (b) Save money

   (c) Never have an accident

10. Having enough air in your t[illegible] will (circle the correct answer)

   (a) Make riding easier

   (b) Protect your tires

   (c) Both 1 and 2

Answers

1. Conserves energy

   Doesn't pollute

   Fun

   Provides exercise

2. Can be easily stolen

   Hard to carry things on a bike

   Not fun to ride in bad weather

   Cannot travel long distance easily

ANSWERS

3. (a) Deciding what kind of bicycle to buy

   (d) Selecting and buying accessories

4. True

5. False

6. (a) Unsafe

   (b) Safe

   (c) Safe

   (d) Unsafe

   (e) Unsafe

7.

8. (b) Last longer

9. (a) Be safer

10. (c) Both 1 and 2

BIBLIOGRAPHY

BIBLIOGRAPHY

The Bibliography contains educational materials for classroom use and for use by teachers in developing relevant units of study on bicycles and bicycle safety. It consists of selected

- Curriculum materials
- Bicycling books
- Sources of additional materials for teachers
- Audiovisual materials
- Periodicals

The individual entries in the curriculum materials and audiovisual materials are presented in the following format:

**	*Title of Work*, author, date of publication. Number of pages or list of materials. Price.
Type of Material	Description of material with evaluation of material's quality and relevance for transportation consumer education. Source from which material may be obtained.*

For purposes of convenience, the curriculum materials have been rated by the designation of stars next to the material description. (See sample above.) The stars represent the authors' evaluation based on the following scale:

no stars:	material is useful, but fair
(*) one star:	material is good
(**) two stars:	material is very good
(***) three stars:	material is excellent

It should be kept in mind that these evaluations are an estimation of the materials' *quality and relevance*.** As such, the absence of a teaching material or a low rating does not per se indicate the material is poor. It may be excellent but simply not relevant to the Manual's content. In addition, any absences may be due to the authors' oversight.

At the end of the Manual is a list of government agencies which can be contacted for further information about bicycles and bicycle safety.

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*Allow ten weeks for delivery of items ordered from the U.S. Government Printing Office.

**A complete discussion of the criteria used to evaluate the materials may be found on pages 468 & 469.

*** *Teacher's Guide for Bike Basics,* 1972. 113 pages. $3.00, notebook.

Guide Comprehensive, detailed, and creative guide on bicycle safety geared to second grade level, but easily adapted to K-4. Although a 72-frame filmstrip is integrated into the activities, the Guide provides considerable background information about bikes and many suggested activities that may be used without the slides. Most of the classroom activities are creative and detailed, including games, puzzles, songs, physical activities, and art. Activities are grouped by subject area, including art, language, math, music, science, and physical activity, enabling teachers to simultaneously teach subject area skills and bicycle safety. A 64-page student self-instructional booklet is also integrated into the guide. Major deficiency in the guide is that it is geared to presenting facts--a cognitive approach--rather than to modifying attitudes and behavior--an affective approach. Issues like peer group pressure, rebellion, risk taking, "kicks," "it-can't-happen-to-me" thinking, and other affectively-based causes for unsafe riding behavior are not treated.

Maryland State Department of Education
P.O. Box 8717
Friendship International Airport
Baltimore, Maryland 21240

** *How Do You Drive a Bike?,* 1974. Teacher's Manual and Activity Guide. 136 pages; twelve 12" x 16" posters; 6 overhead transparencies; 30 copies of thirty-six page student pamphlet; 17-minute tape and 36-frame filmstrip. $59.50.

Module Comprehensive and creative multimedia package that covers what a bike is, traffic signs, signals, traffic laws, and bicycle safety rules. Filmstrip, tape, student booklet, and poster all duplicate the same rhyming, somewhat syrupy test and illustrations and may be used to reinforce each other or independently depending on students' reading level and attention span. Unit does not indicate which activities or sections can be taught at which grade level; instead, and more usefully, notations are provided instructing the teacher to discuss the pictures for children who cannot read the text. The classroom activities section is excellent, including crossword puzzles, story completions, word games, coloring pictures, and simple board games. Illustrations include ethnic minority members, but tend to be middle class. Two deficiencies of the unit are its moralizing approach (the text and illustrations tend to order students to do and not to do things) and exclusively cognitive approach (unit presents facts primarily, and does not deal with issues like peer group pressure, rebellion, risk-taking, "kicks," the "it-won't-happen-to-me" philosophy, and other affectively based causes for unsafe bicycle behavior.)

Kilby Associates
P.O. Box 1113
Pendleton, Oregon 97801

** *All About Bikes: A Bicycle Safety Program*, 1972. 127 pages plus 36 cut-out 3" x 5" cards; 58 visual aids that can be made into transparencies; two student workbooks (basic and advanced) and two teacher workbook editions. $42.00.

Guide Comprehensive elementary curriculum guide on bicycle use and safety. Contents include 58 visual aids which can be made into transparencies, 36 "case histories" on 3" x 5" squares, four to a page; two student (one basic, one advanced) and two teacher work booklets; and instructional objectives, vocabulary and learning experiences covering six topic areas, such as laws, use and accidents. Activity books are useful exercises in identifying objects and hazards in drawings about bicycles; visual aids are useful; case histories are too close-ended; several of the suggested learning experiences are creative and detailed, and a few, including an "intersection" game, are exciting. Major deficiency of the curriculum is that it is geared to presenting *facts*--a cognitive approach--rather than to modifying attitudes and behavior--an affective approach. Issues like peer group pressure, rebellion, risk-taking, "kicks," "it-won't-happen-to-me" thinking, and other affectively based causes for unsafe riding behavior are not treated.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Traffic and Pedestrian Education Systems, 1973. 37 page Leader's Guide, 23 spirit masters, fifteen cassette tapes, fifteen filmstrips. $86.00.

Module Comprehensive multimedia unit covering all aspects of pedestrian safety for youngsters, including crossing streets, selecting safe routes to school, care with railroad tracks, and the meaning of signs. Behavior in cars and bicycle riding are also covered. Unit consists of fifteen modules. For each module the following are provided: audiotape geared to filmstrip; "immediate reinforcement activities" consisting of suggested activities such as songs and children's games; discussion topics; 1-2 activity sheets that are reproduced for students using spirit masters--activities consist of coloring exercises; and supplemental reinforcement activities such as reading poems, making wall murals creating trains out of cartons, role plays, and children's games. Activities are creative but not always detailed. Sheet music for nine songs is provided. Tapes have music, singing, and dialogue. General approach is injunctive and cognitive, but many activities present the opportunity for more open-ended and affectively oriented classroom experiences. Filmstrip and spirit masters use ethnic minorities but are very middle class.

Eilisar Research Corporation
15 East 48th Street
New York, New York 10017

Guide for Leaders: 4-H Bicycle Program, 1971. 19 pages. Free.

Guide Detailed suggestions for 4-H leaders, but equally useful for teachers, on how to teach a unit on bicycles. Guide includes list of study topics, suggested "meeting plans" (activities using bicycles, outdoors for trhe most part); suggested riding activities (e.g., balancing, signaling, entering highway); favorite bike games and races; and a bicycle inspection form and quiz. Guide is primarily designed for use outdoors with each student having his or her own bicycle. Suggested bike games and races have been included in this chapter. Activities--riding and "meeting plans"--are generally fairly detailed and useful, but several require teachers who have a good deal of practical knowledge about bicycles.

U.S. Department of Agriculture
Extension Service
Washington, D.C. 20250

** *Teacher's Guide to Bicycle Safety Activities and Projects,* no date. 12 pages. 6¢.

Pamphlet Series of creative activities, many spelled out in detail, on bicycle safety.

American Automobile Association
Traffic Engineering and Safety Department
1712 G Street, N.W.
Washington, D.C. 20006
Stock No. 3218

* *Bicycle Safety Program Aids,* no date. 10 pamphlets and three posters. 11¢.

Packet Folder of materials on bicycle safety and use. Included are a pamphlet to parents on buying their children a bicycle, the results of an AAA survey on the nature and causes of bicycle accidents, a bicycle skill tests pamphlet (well illustrated and described), and a bicycle inspection checklist.

The American Automobile Association
1712 G Street N.W.
Washington, D.C. 20006
Stock Number 3289

Bicycling and Bicycle Trails, A Trails and Trail Based Activities Bibliography, 1971. 31 pages. $3.00.

Bibliography

Bibliography of books and articles on various aspects of bicycling. Index is conveniently arranged by topic, with largest number of entries being history, safety, and trails. Somewhat outdated due to the great number of bicycle publications since 1971.

National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22151

Bicycle Safety Curriculum Guide, no date. 27 pages. Free.

Guide

Includes expected outcomes and teacher suggestions for classroom activities on bicycle purchase, traffic rules, safe driving, night driving, and maintenance. Activities are few and not detailed. Bicycle safety checklists and purchase considerations checklist are very useful.

The University of the State of New York
The State Education Department
Division of General Education
Albany, New York 12224

*** *Bicycling!* Periodical. August and September 1972 and July and August 1973.

Periodical

Complete bibliographies of all available books, articles, and periodicals on bicycles are contained in these four issues.

Bicycling!
55 Mitchell Blvd.
San Rafael, California 94903

A Great Bicycle Book, by Jane Sarnoff and Reynold Ruffins, 1973. 31 pages. $5.95.

Book Children's book on parts of a bicycle, fitting the bike to the rider, maintenance, and racing games. Illustrated in bright colors, but otherwise book does not contain anything particularly stimulating for children.

Charles Scribner's Sons
597 Fifth Avenue
New York, New York 10017

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General

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*Compiled by Bicycle Manufacturers Association of America, Inc., Washington, D.C.

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Sources of Additional Materials for Teachers

The following organizations provide various pamphlets, booklets, and posters on bicycle safety:

Allstate Insurance Company
Safety Division
Allstate Plaza
Northbrook, Illinois 60062

American Automobile Association
Traffic Engineering & Safety Dept.
8111 Gatehouse Road
Falls Church, Virginia 22042

American Insurance Association
Publications Department
85 John Street
New York, New York 10038

Boy Scouts of America
North Brunswick, New Jersey 08902

Channing L. Bete Co., Inc.
P.O. Box 112
Greenfield, Massachusetts 01301

Employers Insurance of Wausau
Wausau, Wisconsin 54401

4-H Cooperative Extension Service
U.S. Department of Agriculture
Washington, D.C. 20250

Harleysville Mutual Insurance Co.
Loss Control Unit
355 Maple Avenue
Harleysville, Pennsylvania 19438

Highways Users Federation
1776 Massachusetts Avenue, N.W.
Washington, D.C. 20036

Imagination, Inc.
2651 University Avenue
Saint Paul, Minnesota 55114

Kemper Insurance
4750 Sheriden Road
Chicago, Illinois 60640

Liberty Mutual Insurance Co.
2955 N. Meridian Street
Indianapolis, Indiana 46207

Maryland American General Group
Inspection Department
P.O. Box 1228
Baltimore, Maryland 21203

National 4-H Foundation
7100 Connecticut Avenue
Washington, D.C. 20015

National Highway Traffic Safety Admin.
Department of Transportation
Washington, D.C. 20590

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Nationwide Mutual Insurance Co.
246 North High Street
Columbus, Ohio, 43216

State Farm Insurance Companies
Public Relations Department
112 East Washington Street
Bloomington, Illinois 61701

The Goodyear Tire & Rubber Co.
Public Relations Department
Akron, Ohio 44316

The Bicycle Manufacturers Association of America, Inc.
1101 - 15th Street, N.W.,
Suite 304
Washington, D.C. 20005

Audio-visual Materials

Traffic and Pedestrian Education Systems, 1973. 37 page Leader's Guide; 23 Spirit Masters; fifteen cassette tapes; fifteen filmstrips. $86.00.

Module Comprehensive multimedia unit covering all aspects of pedestrian safety for youngsters, including crossing streets, selecting safe routes to school, care with railroad tracks, and the meaning of signs. Behavior in cars and bicycle riding are also covered. Unit consists of fifteen modules. For each module the following are provided: audiotape geared to filmstrip; "immediate reinforcement activities" consisting of suggested activities such as songs and children's games; discussion topics; 1-2 activity sheets that are reproduced for students using spirit masters--activities consist of coloring exercises; and supplemental reinforcement activities such as reading poems, making wall murals, creating trains out of cartons, role plays, and children's games. Activities are creative but not always detailed. Sheet music for nine songs is provided. Tapes have music, singing and dialogue. General approach is injunctive and cognitive, but many activities present the opportunity for more open-ended and affectively oriented classroom experiences. Filmstrip and spirit masters use ethnic minorities but are very middle class.

Elisar Research Corporation
15 East 48th Street
New York, New York 10017

National Directory of Safety Films, 1971. 60 pages. $3.50.

Catalogue Capsule descriptions of safety films that can be rented from the National Safety Council; however, none are evaluated and many are included that are either poor or mediocre. The reader must take "pot luck" and preview all films ordered before using with students. Most of the films listed below are taken from this catalogue.

National Safety Council
425 N. Michigan Avenue
Chicago, Illinois 60611

The Bicycle Clown. 10 minutes, color or black and white, 16 mm.

Film Describes some of the reasons behind a youngster's reckless bike riding.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Bicycle Riding Reminders. 11 minutes, color, 16 mm.

Film

A police vehicle demonstrates reaction time, braking distances, etc. when autos and bicycles are involved. Film gives basic bicycle safety points for younger children.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611
(Rental)

The Bicyclist. 15 minutes, color, 16 mm.

Film

Bicycle safety education for school age children. A red bicycle tells its own story. It has had two owners--a boy who knew and obeyed the traffic rules and another who didn't.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Championship Bicycle Safety. 13 minutes, color. 16 mm.

Film

Fast-paced film which relates the cycling skills of the champs to the skills needed in everyday cycling situations, with emphasis on the idea that it takes practice to ride like a pro. Includes clowns riding antique bikes in a local rodeo who demonstrate the need for watchfulness to avoid hazards.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

The Day the Bicycle Disappeared. 14 minutes, color, 16 mm.

Film

When all the bicycles in town suddenly disappear, it turns out that they are protesting the hazardous riding of their owners. Not until each rider signs a safe bicycle pledge do the bikes agree to go home.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

If Bicycles Could Talk. 13 minutes, color, 16 mm.

Film Covers all aspects of bicycle safety and maintenance, as well as the role of parents in preparing youngsters for bicycle ownership.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

I'm No Fool With a Bicycle. 8 minutes, color, 16 mm.

Film History of the bicycle leads into a discussion of the rules for bicycle riding.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

7 Rules of Bicycle Safety. 6½ minutes, color, 16 mm.

Film A short positive-approach film on bicycle safety for elementary age children. Only the right way to ride is shown as seven rules accepted by safety experts everywhere are illustrated.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Two Wheels Toward Safety. 20 minutes, color, 16 mm.

Film Film shows how bicycle accidents are reduced through education in a community effort in Nassau County in New York.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

You and Your Bicycle. 10½ minutes, black and white, 16 mm.

Film Teaches children correct riding habits. Starts with points of safety maintenance, then shows hazards encountered on a trip to the store for mom. Shows correct arm signals, how to carry bundles, where to park, when and where to ride, results of stunting, passing improperly, hitching rides and riding double.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Periodicals

American Bicyclist
461 Eighth Avenue
New York, New York 10001

Bicycle Journal
3339 West Freeway
Fort Worth, Texas 76107

Bike World
Post Office Box 366
2536 Middlefield Road
Mountain View, California 94040

Bicycle Dealer Showcase
Post Office Box 2830
Newport Beach, California 92663

Bicycling
119 Paul Drive, Box 3330
San Rafael, California 94902

League of American Wheelmen Bulletin
19 S. Bothwell
Palatine, Illinois 60067

TRANSPORTATION SAFETY

WHY TEACH ABOUT TRANSPORTATION SAFETY

The Problems

The overview at the beginning of this Manual has already pointed out that travel and transportation play a tremendously important role in the lives of Americans, as all of us drive and walk almost every day and frequently ride buses, trains, planes, and boats or ride around on recreational vehicles. Most of that travel is safe, speedy and pleasant. But when millions of people travel billions of miles, it is not surprising that accidents do happen. Greater safety can be achieved if the persons who travel--that is, all of us--become better informed about transportation services, the different modes of transportation, the special advantages of some, the special dangers of others, and the things that can be done to improve our safety while we travel.

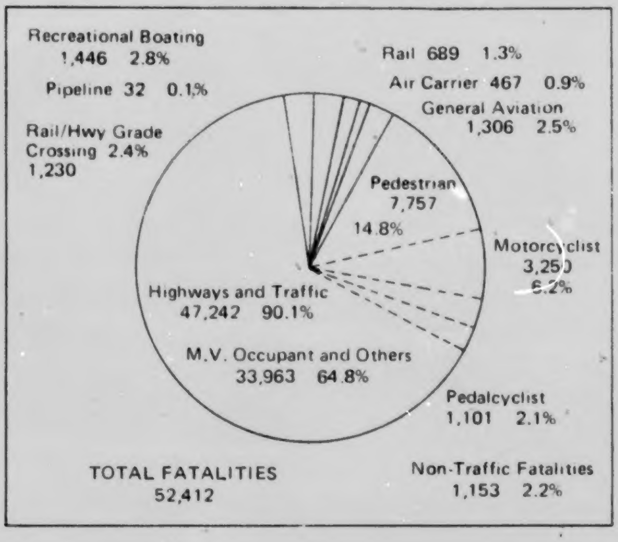
The safest way to travel is to walk. When we walk we can control where we go, when we go, how fast we go or if we go at all. Yet even pedestrians have accidents. Roughly 300,000 to 400,000 pedestrian accidents occur each year, with 8,000 to 9,000 fatalities.

Americans drive a staggering number of miles each year. The safety record of American drivers is good: there is only one traffic fatality for every *25 million* of miles driven. Yet the record could be even better, and we should work to reduce the number of traffic fatalities from 50,000 each year to a lower number.

Travel for vacation and recreation should be enjoyable and safe--and most of it is. Few things are more tragic, however, than a recreational trip that is marked by an injury or even a death. Accidents do happen: in 1974 there were, for example, more than 1,400 fatalities from boating and almost 1,000 fatalities even from bicycling.

The following chart, adapted from U.S. *Transportation Information Report*, presents the total figures and relative percentages of transportation fatalities for 1974.

TRANSPORTATION FATALITIES: 1974



The Solutions

Federal, state, and local governments must promote transportation safety by providing assistance for planning, development, and financing of improved transportation vehicles and facilities. They must also enact legislation which will encourage the manufacturers of vehicles to develop the safest possible vehicles and which will stimulate the public to engage in safe travel practices.

Local transit authorities--public transportation companies, taxi companies, ferry agencies--must provide maximum safety provisions for their customers.

Citizens and consumers must be careful. They should use different modes of transportation with full awareness of their dangers and what should be done to minimize these dangers: they should purchase vehicles that are safe to operate and maintain them in proper operating condition; persuade other people to travel safely; and participate in transportation planning to ensure that safety needs are adequately considered in the developing and servicing of vehicles and transportation facilities.

Teachers must guide students to a better understanding of the dangers involved in all kinds of travel and of ways to minimize or prevent them. Transportation consumer education can offer the student a unique opportunity to develop the awareness and skills needed to acquire responsible transportation habits and to play a role in supporting and improving transportation safety in the community.

This Chapter focuses on teaching transportation safety by developing consumer skills that are particularly appropriate to grades 4 and 6. The learning activities are designed to make students aware of the dangers involved in all modes of travel, including walking, boating, and riding in automobiles, trains and airplanes; to introduce to students many of the nonrational considerations that result in dangerous travel behaviors, including peer pressure and thrill seeking; to encourage students to practice safety when they are passengers riding in vehicles; to motivate students to encourage other people to engage in safe travel practices; and to develop skills in making use of emergency vehicles that are available to the local community.

TRANSPORTATION SAFETY

Activity #	Activity Description	Class Time[a] (periods)
	Mini-unit 4 Learning about automobile safety	
17	Students discuss common driving practices which make driving dangerous and develop collages illustrating those habits.	1½-2
18	Students role play drivers and passengers in situations that involve safe (or unsafe) driving habits.	1
19	Students discuss safety belts and play a boardgame reinforcing their use.	1½-2
20	Students answer "Dear Abby" letters from classmates on safety belt problems and implement a plan to persuade a friend or relative to use safety belts.	1-2
	Mini-unit 5 Learning about pedestrian safety	
21	Students conduct an experiment on group pressure and discuss peer pressure and why people exert pressure on others to walk and play unsafely and safely.	2-3
22	Students explore ways to cope with pressures to walk and play unsafely by responding to hypothetical letters from students.	1
23	Students discuss what restrictions they would set for children on walking and playing safely.	1
24	Students engage in one or more mini-activities on pedestrian safey.	½-1
	Mini-unit 6 Learning how to be safe while boating	
25	Students collect, look at, and handle various safety items that a boat is required to have and learn how to avoid common, unsafe boating practices.	1-2
26	Students role play a family involved in a boating incident.	1

[a] Assumes class period of 30-40 minutes.

Chapter 2

TRANSPORTATION SAFETY (CONTD.)

Mini-unit 7

Learning about emergency vehicles

Activity #	*Activity Description*	*Class Time*[b] *(periods)*
27	Students identify the emergency services available in their community and the reasons for which each is used.	1-2
28	Students role play their reactions to household and community emergencies.	1
29	Students present skits depicting emergency situations.	1-2
	Mini-unit 8 Learning about safe travel behavior	
30	Students develop stories about transportation safety to present to lower grade classes.	3-5
31	Students take field trip to railyards, railroad crossings, or subway stations to observe precautions they and others should take regarding rail safety.	2-3
32	Students play a card game and a board game game which teach the difference between safe and unsafe travel behaviors.	½-1
	Supplementary Activities	
33	Students answer questions on transportation safety.	½-1

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[b] Assumes class period of 30-40 minutes.

MINI-UNITS
AND
LEARNING ACTIVITIES

MINI-UNIT 4

LEARNING ABOUT AUTOMOBILE SAFETY

This mini-unit deals with the basic form of motorized transportation in the United States, the automobile. Specifically, it focuses on increasing student awareness of safe behavior for automobile passengers and drivers.

All too often safety is assumed to be the sole responsibility of the driver. In this mini-unit we point out that this is not so. Passengers also have a responsibility when riding in an automobile to keep in mind their own safety and that of others.

The first activity looks at common driving practices which can make riding in an automobile unsafe. Often these are practices people do not think are hazardous--eating while driving, combing hair, reading route maps--but which can lead to accidents. The second activity is directed to passenger behavior. It brings to students' attention things they may do, often unconsciously, that can disturb a driver and cause an accident. The last two activities in the unit stress the importance of safety belts for all automobile riders and the responsibility each of us has to wear one.

The major concepts covered in this mini-unit include

- Automobile accidents can be caused by many seemingly harmless activities.
- There are many different kinds of distractions that can cause unsafe driving practices.
- Safety belts are an important part of automobile driver and passenger safety.

MINI-UNIT 4 LESSON PLAN

Learning about automobile safety

Activity #	*Activities*	*Class Time*
17	DESCRIPTION: Students discuss common driving practices which make driving dangerous and develop collages illustrating those habits. OBJECTIVE: By the end of the activity students will be able to name three unsafe habits of automobile drivers and passengers and one way each may be discouraged.	1½-2 periods
18	DESCRIPTION: Students role play drivers and passengers in situations that involve safe (or unsafe) driving habits. OBJECTIVE: By the end of the activity students will be able to identify those pressures on drivers and passengers that can result in unsafe driving.	1 period
19 Spirit Masters #4, #5, #6 & #7	DESCRIPTION: Students discuss safety belts and play a board game reinforcing their use. OBJECTIVE: After completing this activity, students will be able to demonstrate knowledge of the importance of wearing safety belts by responding to a given scenario which describes someone who won't or doesn't wear safety belts.	1½-2 periods
20	DESCRIPTION: Students answer "Dear Abby" letters from classmates on safety belt problems and implement a plan to persuade a friend or relative to use safety belts. OBJECTIVE: By the end of the activity students will be able to identify, orally or in writing, the more effective ways to persuade people in given situations to wear safety belts.	1-2 periods

Total Class Time: 5-7 periods.

ACTIVITY #17

Mini-unit Topic: Learning About Automobile Safety

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students discuss common driving practices which make driving dangerous and develop collages illustrating those habits.

Objective:

By the end of the activity students will be able to name three unsafe habits of automobile drivers and passengers and one way each may be discouraged.

Concept Treated:

- Automobile accidents can be caused by many seemingly harmless activities.

Materials Needed:

Magazine or newspaper pictures, crayons, construction paper, scissors.

ACTIVITY

To start your students thinking about significant but seemingly harmless driving hazards, ask them to think of any things they do or have done while riding their bicycles or walking that might lead to an accident, or have caused them to have an accident or a near accident.* Many of the things that appear in the list below more than likely will be mentioned by your students in relation to their own experiences. These include daydreaming while walking or riding a bike, talking animatedly to a companion or another bicyclist, looking at the scenery while walking, eating and drinking, and riding or walking while very upset.

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*Mini-unit 3 in Chapter 1, "Bicyles and Bicycle Safety," deals with "Using Your Bicycle Safely." You may wish to refer to that mini-unit for bicycle safety activities for your students.

As each practice is mentioned, discuss it in relation to automobile safety and list it on the chalkboard for further reference. With this insight, students will be able to more fully appreciate the impact this type of behavior can have on automobile safety.

Next, discuss any driving habits that your students recognize in their parents or other drivers as being unsafe. You may wish to show the class the illustrations included at the end of the activity as examples of unsafe driving habits. Very often drivers do not realize that what they do in the car in addition to how they drive, may be as unsafe or potentially hazardous as driving too fast. Among the things that create hazards are failure to clean windshield and rear window, especially during or after a snowstorm or driving on muddy roads; daydreaming; girl and boy watching; reading maps; engaging in personal hygiene (combing hair, putting on lipstick); riding with boisterous or easily panicked pets; fiddling with radio or tape deck; eating and drinking; talking animatedly; chasing bugs which fly into a car; restraining children; viewing scenery; being distracted by passengers who are talking excessively, pointing out scenery, horsing around, arguing, and being affectionate; driving while sleepy or very upset; lighting a cigarette, cigar or pipe; and searching for things in pockets, wallets, glove compartments, back seats, or purses.

At the conclusion of the discussion, students make a collage illustrating these unsafe practices. Pictures of the items that contribute to these habits (cigarettes, food and beverages, bugs, people talking, maps, people combing hair, putting on lipstick, barefeet) are cut from magazines or newspapers, or drawn by hand. The pictures are then pasted, collage fashion, inside an outline of a bulletin board-size automobile and displayed in an appropriate place.

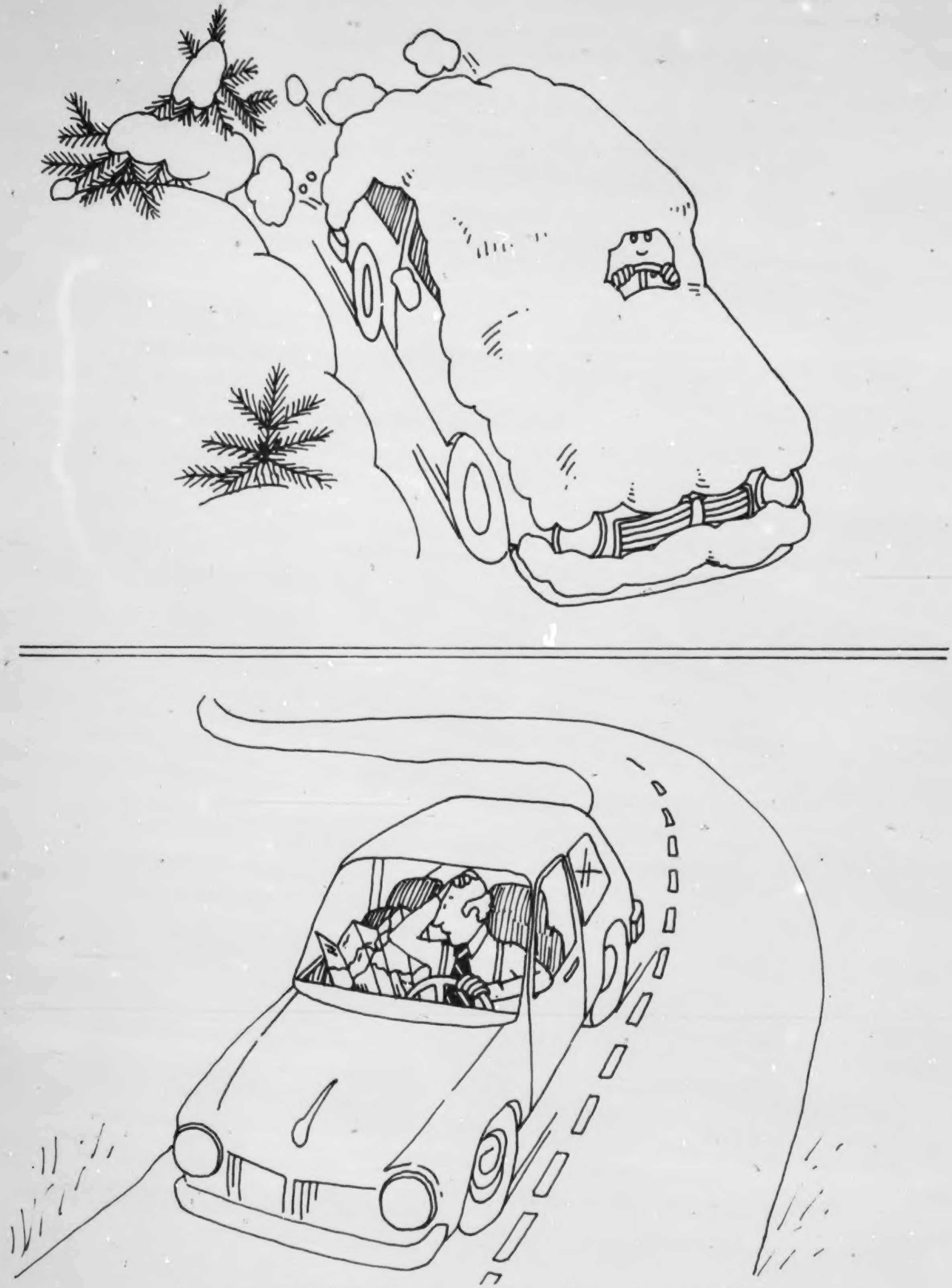
When the collage has been completed, discuss one or several of the following issues:

- When you realized you had done something foolish that caused or could have caused you harm, did that stop you from ever doing it again? Why or why not?
- If you were with someone who was doing something you thought might result in an accident, would you say something to ask them to correct their behavior? How would you do this without offending them?
- How would you react if someone told you you were riding your bicycle or walking foolishly and might get hurt? What would you say to that person?
- Would you ever tell your parents that you thought what they were doing while driving might result in an accident? How might they react and why?

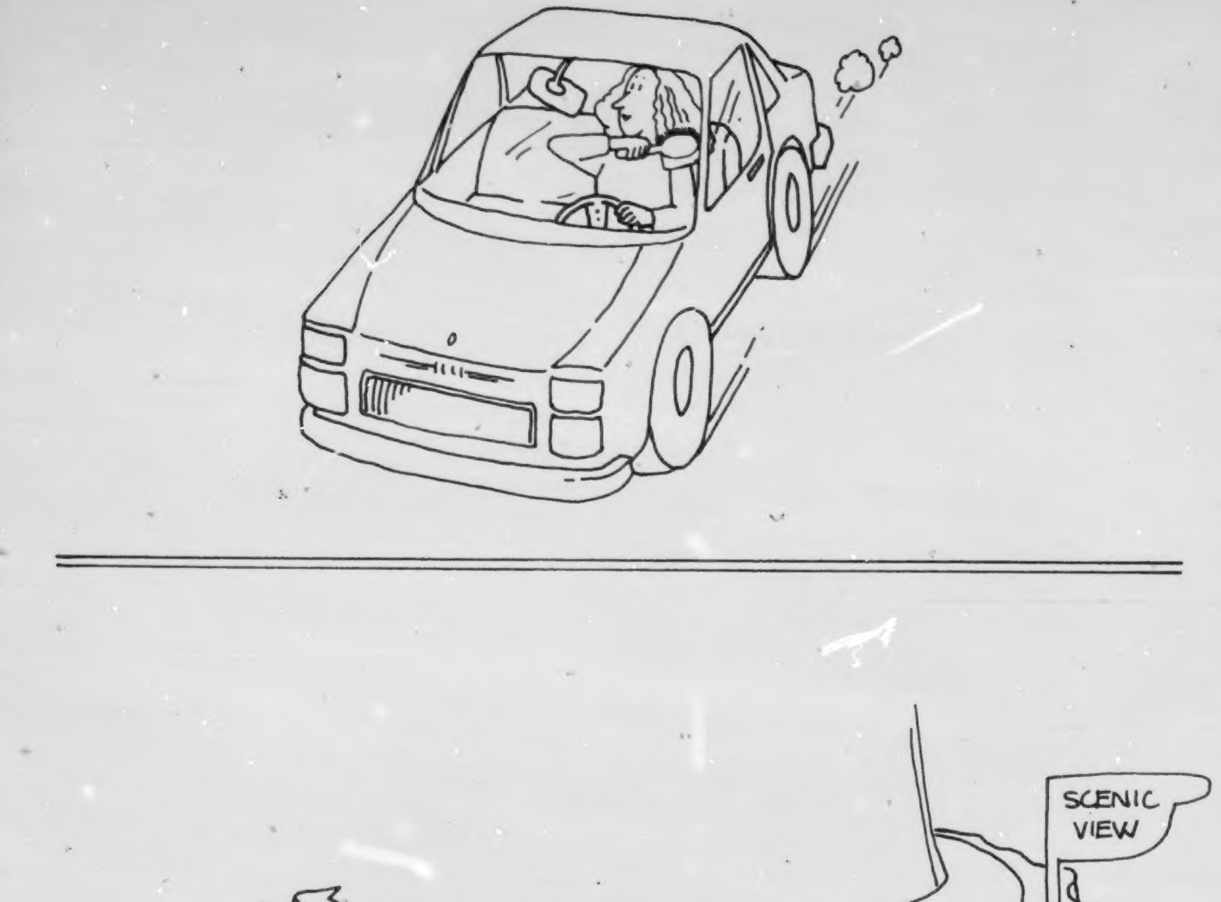
Variations and Supplementary Activities:

Students can observe their parents or neighbors who have safe and unsafe driving habits.

Students can compile a booklet on unsafe behavior of bicyclists, pedestrians, and automobile drivers and the resulting dangers.



What are these drivers doing that is unsafe?


SCENIC VIEW

What are these drivers doing that is unsafe?

ACTIVITY #18

Mini-unit Topic: Learning About Automobile Safety

Approximate Class Time: 1 period

Capsule Activity Description: Students role play drivers and passengers in situations that involve safe (or unsafe) driving habits.

Objective:

By the end of the activity students will be able to identify those pressures on drivers and passengers that can result in unsafe driving.

Concept Treated:

- There are many different kinds of distractions that can cause unsafe driving practices.

ACTIVITY

Place several chairs at the front of the room to set the stage for short automobile trip skits. Ask for volunteers or assign students to fill the various parts outlined in the role profiles which appear on the next pages. Each skit takes place in a car when en route to its destination. The students in the skit leave the room while the profiles are read to the class. The students return to the room and each reads the profiles to him or herself or you can read them to them. After you provide a scene-setting introduction, the skits are acted out spontaneously. After each skit, the participants tell how they felt about the trip and each other's behavior. The class then discusses the specific problems associated with the trip and how the trip could have been made better and safer for both driver and passengers.

After all the skits have been performed, discuss the following issues:

- How do you feel when you are trying to do something and somebody is bothering you?

- How do you think a driver feels when he or she is in the car and is being bothered?

- What is the difference between being distracted at home and in a car?
- Who is responsible for making a trip safe? Why? What are your responsibilities when traveling in an automobile?

Variations and Supplementary Activities:

Students can make posters promoting safe passenger/driver behavior.

As a class, students can draw up driver and passenger safety rules.

Skit 1: Family Going to the Beach

Driver (mother or father): Traffic is just terrible. It has been bumper to bumper ever since you left home an hour ago. The beach is great but why does it take so long to get there? The kids have been jumping around the car from the minute they got in. And, the dog should have been left at home. Your wife (husband) is no help in keeping the kids entertained. She (he) just stares out the window pretending everything is just fine in the back seat. Oh no, the noise is getting worse--and why is that dog whimpering? Those kids are going to get it if they don't keep the noise down. You've had it! What do you say?

Parent (mother or father): You are so exhausted. It took forever this morning to get the kids ready to go to the beach. You forgot to buy ham for sandwiches so all you've got for lunch today is peanut butter and jelly. Ick! Why doesn't anything ever go right? There better be enough towels, suntan lotion, balls, books, dog bones, shovels, pails, radios, magazines, cookies, and bottles of tonic to keep everybody happy. All you want to do is get to the beach and sleep. These trips just aren't any fun anymore. And why does everybody have to go to the beach on the same day? This traffic just won't move. Why can't your husband (wife) drive this car any faster? You're just poking along. You'll get there by supper time at this rate. Oh no, what is going on the back seat? If those kids get into a fight you're just going to have Fred (Sally) stop the car and they can get out and walk to the beach--and that dumb dog too. You can't stand anymore! You've got to say something.

Jimmy: Boy, is it ever hot in this car. Why can't Daddy and Mommy buy air conditioning when they get a car, like Jessica's mother and father? Your legs stick to the seat, and bugs come in the windows. You're not even allowed to drink pop while you're riding in the car because you might spill something. This just isn't any fun at all. And that stupid sister of yours sitting over there with her head out the window. She is really making you mad. She knows she's not supposed to do that but she always gets away with everything. She should only fall out of the car. Of course, at the rate you're moving, she wouldn't even scrape her elbow. Hey, what's that bug doing flying in your window? Oh boy, he landed right on the window ledge. Let's see if you can roll the window up and crush him. Owwww!!!! You caught your finger in the window!!!! What do you do?

Donna: This is really neat. You love to ride with your head out the window, it is so much cooler. You get to sing as loud as you want and look in the windows of the car going by and see what everybody is doing. If your mother notices, she is going to yell at you, but she is looking out her window. Thank goodness. The car ride has been really fun so far. Your brother is over there talking to himself and hasn't bothered you once. The dog is asleep on the floor. And, your parents haven't said one word since you left home. You wish all your car trips could be like this. Well, one more verse of "One Hundred Bottles of Beer on the Wall" and then you're going to wake the dog up to see if she wants to play for awhile. Hey, your hat just flew out the window. What do you do?

Flora (the dog): Boy is it hot in this car! Why does this family have to take you everywhere they go? You would rather have stayed home in your nice, cool doghouse. At least the kids haven't been poking you like they usually do. You have even been able to get a little sleep since you left home. However, it did take awhile to get used to Donna's singing and Jimmy's mumbling. Now back to sleep. Oh, oh, where did that bee come from? He's heading right for you! Owww!!!! You better do something about that bite!

Skit 2: Three Boys on Their Way Back to College After a Vacation at Home

Jerry: You and your friends Tony and Don are on your way back to college from your week's vacation. It was good to be home but you're looking forward to going back to school to finish out the year. You have been driving for about 2½ hours and are feeling a little stiff. It should be close to time for Tony to take his turn at the wheel. Oh boy, it looks like you're coming into a city. You didn't realize you would have to cope with city traffic. Hopefully there will be signs to lead you around the city so you don't have to drive through it. It would be nice if Don would put away that dumb crossword puzzle and start looking at the road to help you get through this mess. And what is Tony doing in the back seat?

Don: It sure is terrific that Jerry has a car and can give you and Tony rides home from college at vacation time. It is much more fun making the trip with other people. Traveling alone on the train is so boring. This crossword puzzle you've been working on for the past ½ hour is really tough. What's a nine letter word for "daily reader" anyway? Jerry is pretty good at these things, maybe he can give you some help. Doing these things as a team usually works out better anyway.

Tony: Gee, it's only 11 o'clock. It seems like the three of you have been driving for days. You won't get back to school until late this afternoon. Maybe you should try to take a nap--that always helps to make the time go faster. But before you do that, you think you'll have a little snack. Jerry's mother packed enough sandwiches and cookies for an army, and Don's mother sent along more fruit than your whole dorm could consume in a month. Let's see, what kind of sandwiches have we got here? Maybe somebody in the front seat might like something to eat too?

Skit 3: After School Carpool

Amy Flynn: You just hate it when it's your mother's turn to drive. She expects you to keep all the other kids quiet and on their good behavior. If anyone gets out of hand you get blamed and not they. And when the kids are having fun in the back seat you have to sit still in the front seat worrying that they may get too noisy and bother your mother. The noise never bothers you. Why should it bother her? Oh no, Joe Kramer is at it again. Why can't he leave Patty alone? You better do something quick before your mother gets upset.

Joe Kramer: Wow, you can really let go today because Mrs. Flynn is driving. She never yells at the carpool kids when she's driving, but you can tell she gets really mad when you make a lot of noise. The back of her neck gets red and she keeps giving Amy dirty looks. Amy is such a goody-goody anyway that you don't care if she gets in trouble with her mother. Oh neat, Patty is sitting next to you. She is great fun to tease. Sometimes she gets so mad she cries. Let's see how long it takes before she cries today.

Patty Kimble: Where is your safety belt? Your mother always said never ride in a car without wearing your safety belt. Oh good--here it is under the seat. But it seems to be stuck. Maybe if you pull really hard it will come free. Why is Joe Kramer looking at you like that? If he starts teasing you today you are just going to scream bloody murder. Okay now, one more good tug on this safety belt and you should have it. Oh no! You ripped your skirt!

Rob Hogan: Oh no, it's Mrs. Flynn's turn to drive the carpool this week. She is the worst driver you have ever seen. She's even worse than Uncle Albert. She does a million dumb things when she drives like not signaling for turns and slamming on the brakes. The last time she drove she nearly ran into a bus. She slammed on the brakes so hard you almost ended up in the front seat. It really makes you nervous to ride in her car. Maybe you should give her a hand with the driving by riding "lookout." Here comes a big truck now. You better tell her it's coming, she probably doesn't see it.

Mrs. Flynn: There is nothing worse than driving a car full of noisy kids. It is so hard to drive while a bunch of kids are jumping around the car screaming and yelling. You finally gave up scolding them because you couldn't drive and tell the kids to quiet down at the same time. You even had to put Amy in charge of keeping the other kids quiet. She really hates that job but she must learn that when her friends are in your car it is her responsibility to keep them quiet. You hope that the kids will be good today. You have a terrible headache and the car is making funny noises which are making you very nervous. The least outburst from the back seat is going to send you through the car roof.

ACTIVITY #19

Mini-unit Topic: Learning About Automobile Safety

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students discuss safety belts and play a board game reinforcing their use.*

Objective:

After completing this activity, students will be able to demonstrate knowledge of the importance of wearing safety belts by responding to a given scenario which describes someone who won't or doesn't wear safety belts.

Concept Treated:

- Safety belts are an important part of automobile driver and passenger safety.

Materials Needed:

Game board and cards (Spirit Masters #4, #5, #6 and #7), playing pieces.

ACTIVITY

Begin this activity by having students fill in a brief questionnaire about safety belt facts. A sample questionnaire is provided with this activity. Tabulate the answers on the chalkboard and then discuss each question and the value of safety belts in general using the information supplied at the end of the activity.

You can also concentrate on different aspects of safety belt use depending on the needs of the class. For example, stress can be placed on the value of safety belts for young children, the importance of safety belts for passengers, myths about safety belt use, and how safety belts can prevent accidents from happening. A follow-up discussion can be held on a variety of related safety belt issues. Some of these issues are

- Are people generally aware of the usefulness of safety belts in preventing or reducing injuries?

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*Game developed by the U.S. Department of Transportation, National Highway Traffic Safety Administration.

- If so, why do they still fail to use them? Do different people have different reasons for not using them?

- Should friends or relatives try to convince each other to wear them or should they "mind their own business"?

After the discussion students can play the game found on Spirit Masters #4, #5, #6, and #7. Divide the class into groups of 3 or 4 students. Pass out the game boards and safety belt cards.* Each player will need a playing piece (paper clip, pencil eraser, chalk, button, pebble). Prior to play you may want to read aloud the instructions which appear on the game board and answer any questions from students.

This game can also be played by students in their free time.

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*Paste both the game board and the safety belt cards onto cardboard for durability. A manilla folder works well for this. Paste the game board onto the open folder. Close the folder to store the game for later play. Paste the front side of the cards onto one side of a piece of cardboard and the back side of the cards onto the other side of the cardboard. Cut along the lines.

Sample Questionnaire on Safety Belt Use

		True	*False*
1.	Very few people will get into a serious automobile accident during their lives.	☐	☐
2.	Accidents at slow speeds rarely involve serious injuries or deaths.	☐	☐
3.	Most accidents causing injury or death occur at speeds of less than 40 miles per hour.	☐	☐
4.	Even wearing safety belts, people in many serious accidents are still usually killed.	☐	☐
5.	Shoulder belts add a great deal to the protection offered by lap belts.	☐	☐
6.	Passengers in the rear seats of cars don't need to wear safety belts as much as people in front seats.	☐	☐
7.	Safety belts sometimes prevent accidents because they can increase the driver's control over the car.	☐	☐
8.	If people drive very carefully, they don't need to use safety belts because they can make sure they don't get into an accident.	☐	☐
9.	Accidents occur more often on city streets than on freeways and turnpikes.	☐	☐
10.	Most Americans use safety belts most of the time.	☐	☐

Correct Answers

1. F
2. F
3. T
4. F
5. T
6. F
7. T
8. F
9. T
10. F

The Facts About Safety Belts*

Almost everybody has some conception of how seat belts contribute to personal safety. People know that belts reduce injuries caused by striking "hostile surfaces" in the car interior. (This is the so-called "second collision." The first collision occurs when the vehicle strikes, or is struck by, another object. The "second collision" occurs when the occupant of the vehicle is flung against the instrument panel, windshield, windows and side panels, roof, doorknobs, steering wheel, and so forth. Incidentally, any one occupant can have several "second collisions" during a single accident, depending on how much he gets tossed around inside the car.) People are also aware that belts increase safety by holding the occupants inside the car, avoiding injury from "ejection."

People are generally less aware of other contributions. For example, in a collision the occupants can fly into or roll over each other; by keeping them in place, belts reduce their chances of becoming another source of injury to each other. Belts can also help to prevent accidents. By keeping the driver firmly in place, they increase his control of the vehicle. By keeping the driver in a comfortable position, they can reduce fatigue and make driving a little safer. Children who are firmly buckled in are less likely to distract the driver's attention from the problems of driving. And so it goes.

However, the average person's knowledge in this area is probably superficial and somewhat vague. Maybe that is one reason why belt usage is so low--people "sort of know" that belts help, but don't know exactly what they do or how well they do it. The short paragraphs below should help in that regard. They quote or paraphrase information that appears more extensively elsewhere. (The source document that the paragraph is based on can be found in the *Automobile Safety Belt Fact Book*).

It *can* happen to us: *there is a high probability that the average motorist will be involved in an accident someday soon.*

> Within the next 16 seconds--and every 16 seconds thereafter--somebody will be injured in a motor vehicle accident. Every 10 minutes, someone will be killed. By the end of this week, about 1,000 people will have been killed and 40,000 injured. Within a year, this will total about 2,050,000 deaths and injuries.
>
> One thousand Americans are killed every week in traffic accidents. Almost 10,000 are injured every day. Annually, this approximately equals the number of babies born in the United States yearly. Statistically, this means that "every American born from today forward may be killed or injured in an automobile crash."

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*Excerpted from *Automobile Safety Belt Fact Book*. U.S. Department of Transportation, National Highway Traffic Safety Administration.

Of the 139 drivers "at fault" (that is, responsible for the accident) at least half had been drinking. Even good drivers are at the mercy of bad drivers.

Many motorists believe that it is not necessary to use belts when traveling at lower speeds. This is not true.

More than half of the accidents causing injury or death occur at speeds less than 40 miles per hour. In rural areas, one-half of the fatal accidents occur at speeds under 50 mph. Almost 50 percent of all rural accidents happen at speeds under 30 mph.

In one statistical analysis of 28,000 accident cases, fatalities of "non-belted" motorists occurred over the whole speed scale, starting as low as 12 mph.

Yes, they *really* do work: *some research findings about the effectiveness of safety belts.*

If all passenger car occupants used lap belts, some 10,000 lives would be saved each year. Combination (lap/shoulder) belts would save some 20,000 lives.

In a study of 160 collisions,

at least one occupant involved in each collision was wearing a combination (that is, lap and shoulder) belt. Ninety-six of the vehicles sustained heavy damage of the type that usually involves injury to the occupants. However, 99 percent of the occupants using combination belts had either no injury, or only minor injury.

In a study of the effectiveness of the three-point harness in 28,000 accident cases:

Without the harness: fatal injuries throughout the whole range of accident speeds. With the harness: no deaths at speeds under 60 mph. The average injury-reducing effect of the harness was 40 percent to 90 percent.

From data on 14,261 occupants of passenger cars involved in rural crashes--2,359, or 16.5 percent, were wearing a lap belt (no shoulder restraint usage reported).

In similar crashes, the unbelted occupants were injured substantially more frequently and more severely than the belted ones. In round figures, failure to use seat belt(s) increased injury risks as follows:

- Of immediate death or severe injury...by 100 percent
- Of more than trivial injury...by 70 percent

- Of any injury...by 40 percent

For all practical purposes, use of seat belts prevented ejection from the vehicle. This effect was estimated to account for about one-quarter of the above risk differentials. The remainder, or three-quarters of the risk differentials, are attributed to the effect of seat belt(s) in (1) preventing injury, and (2) alleviating injury sustained within the vehicle.

The probability of death is almost five times greater when the motorist is thrown from the automobile ("ejected"). If ejection could be totally eliminated in automobile accidents, about 5000 to 6000 lives could be saved each year.

Seat belts are the most effective way to prevent ejection.

Even if all they did was prevent ejection, seat belts could reduce accident deaths by about 25 percent.

During an accident, people may also come into violent contact ("impact") with the car itself--doors and side panels, steering assemblies, instrument panels, and roofs. These "second and third collisions" are a major cause of death.

Lap belts permit the occupant's upper torso to "jackknife" forward and strike the car interior. However, the belts tend to reduce this impact to tolerable levels. By the time the belt-user begins to jackknife forward, the belt has already reduced the forces of impact. Shoulder belts prevent jackknifing, reducing injuries even further.

In a collision, children who are riding in the rear seat tend to become "airborne." They fly forward and are injured by impact with windshields, rear-view mirrors, instrument panels, heaters, etc. They also cause injury to the front-seat passengers by hurtling into them.

An adult in the rear seat tends to injure his face and head against the front seat. Legs are trapped under the front seat and broken. Also, an adult in the rear seat will hurtle forward, causing injury to front-seat passengers.

Safety belts can even keep accidents from happening. When seat belts keep the driver behind the wheel, everyone is safer.

Item: An unbelted driver took the corner too fast. He was thrown off balance and lost control of the car. A collision resulted.

Item: A car sideswiped a parked car. The driver (unbelted) lost control of the car, which swerved across the roadway where it collided with an oncoming car. Little if any injury resulted from the collision with the parked car, but serious injury occurred to occupants of both cars in the head-on collision.

Item: While crossing the Golden Gate Bridge, the right-front wheel of the bus ran over a cement block which had fallen onto the roadway. The impact threw the driver out of his seat, into the stairwell. Out of control, the bus ran over the side of the bridge. There was one survivor.

In short, by keeping the driver in place, in control of the car, seat belts can prevent accidents from happening and can keep mild accidents from turning into serious ones.

During an accident, children who are not belted become a hazard to everybody by becoming airborne and hurtling into other occupants. Unbelted children can also cause accidents. For example, a driver's attention was diverted when one of her children fell off the seat. She took her eyes off the road, swerved, and ran into a truck. The score:

Driver:	Minor bruises
Child 1:	Severe cut on head
Child 2:	Concussion
Child 3:	Near-fatal scull fracture
Child 4:	Severe head injuries

There are two points to observe: one, if all the children had been restrained, the accident would not have happened; two, if an accident does happen, seat belts protect the children from injury. The point is, would you rather have a sore shoulder or a skull fracture? *Some answers to the rumors about injuries caused by safety belts.*

> In the vast majority of accident cases, the seat belt presents no hazard to occupants except possibly in unusual and isolated instances. Under some extremely severe conditions, seat belts could cause serious injury; however, even so, the injured motorists would probably be even worse off without belts.
>
> If a car is hit from the side at the point where a motorist is sitting, he is likely to be injured whether he is or is not wearing a seat belt. However, this happens in only a small proportion of all accidents.

Based on a study of 382 accidents:

> In no case did a belt cause an injury that was more severe than the injury that would have resulted had a belt not been worn.

In an analysis of 28,000 accident cases:

> Injuries caused by the safety belt were reported in 34 cases for drivers and 25 cases for the front-seat passenger.

	Driver	*Front-Seat Passenger*
Slight single rib fracture (no hospitalization; in two cases, belt was worn too loose)	10	10
Pain in chest and bruises	6	5
Slight to moderate fracture of chest bone	3	1
Bruises and soreness in lap area	3	2
Bruises and soreness in shoulder area	1	2
Fracture of collar bone	3	2
Slight superficial wound of neck	1	1
Soreness in back	2	
Slight injury, not defined		1
Multiple rib fracture	5	1

Most injuries reported to be caused by belts occurred in accidents in which occupants not wearing belts were seriously injured and in accidents at high speeds.

Therefore, the injuries caused by the seat belts were very slight in comparison with the injuries sustained by motorists not wearing belts in the same accidents.

Myths and Facts About Safety Belt Use

The Myth: If I'm just going shopping, why bother? I don't need a belt driving around town at low speeds.

The Fact: Injury causing accidents occur at all speeds. Furthermore, the accident rate is lower on turnpikes and freeways than on city streets.

The Myth: What if the safety belt traps me in a burning or sub merged automobile?

The Fact: Without a belt, the motorist may be dazed or stunned by the crash; this would increase the time it takes to get out of the car. With a belt, the motorist is more likely to be unhurt, alert, and capable of getting out quickly. Therefore, the belt will speed up, rather than slow down, the escape process.

The Myth: Many motorists have been "saved" by being thrown out of the car.

The Fact: There is virtually no situation in which people are not better off inside the car.

The forces in an accident are so great that a person ejected from an automobile can be flung 40 to 50 feet or more, from the car. (One body was found 150 feet from the car from which it had ejected.) Whether this distance is covered through the air, scraping along the ground, or both, it is highly likely to have serious results. In other cases, the car door is sprung, the motorist falls out, and the car rolls over and crushes him. Despite any emotional fantasies about "being thrown clear," sheer common sense--based on extensive statistics--say it's better to stay inside the car.

A station wagon carrying a family of six was struck from the rear. It ran off the road and rolled over. The mother flew out the door and was killed when her head hit a rock. Three of the children stayed in the car; all had broken bones, but lived. The father stayed in the car and was not injured. When the police arrived, the father was frantically searching for the 18-month-old boy his wife had been holding on her lap. Half an hour later, they found the baby. Otherwise unharmed, he had drowned because he was hurled into six inches of water.

The probability of death is almost five times greater when the motorist is thrown from the automobile.

Safety Belt Use

Belt usage varies from trip to trip. The same person may wear a belt on one kind of trip, not wear it on another. For "short" trips--under 25 miles each way--the drivers report belt usage as follows:

Always use: 17 percent of the drivers

Sometimes use: 32 percent of the drivers

Never use: 51 percent of the drivers

For "longer" trips--26 to 150 miles each way:

Always use: 39 percent

Sometimes use: 26 percent

Never use: 35 percent

For "cross-country" trips--over 150 miles each way:

Always use: 44 percent

Sometimes use: 28 percent

Never use: 28 percent

Ninety-five percent of all the trips made by these drivers were "short" trips: of every 20 trips, 19 were "short." Only 66 percent of the drivers go on "longer" trips. Only 33 percent make "cross country" trips. The drivers who use lap belts most often also tend to use shoulder belts most often. Similarly, drivers who use lap belts least tend to use shoulder belts least.

ACTIVITY #20

Mini-unit Topic: Learning About Automobile Safety

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students answer "Dear Abby" letters from classmates on safety belt problems and implement a plan to persuade a friend or relative to wear safety belts.

Objective:

By the end of the activity students will be able to identify, orally or in writing, the more effective ways to persuade people in given situations to wear safety belts.

Concepts Treated:

- Many people don't like to wear safety belts.
- Many people don't believe the factual evidence that safety belts save lives.
- There are ways to persuade people to wear safety belts.

ACTIVITY

Students begin the activity by individually identifying a friend or relative whom they would like to induce to wear safety belts. Each student then writes a "Dear Abby" letter in which he or she states the problem and asks for advice on how to motivate this other person to wear safety belts. Sample letters appear at the end of the activity. Collect all the "letters" and duplicate them, providing each student with copies of the letters written by two to four other students. Each student then plays the part of Abby and writes responses to each letter, providing suggestions on how to go about persuading the person to use a safety belt. The responses are returned to the students to whom they apply.

Each student then develops a strategy by which to persuade his or her friend or relative to wear safety belts. The strategy is written down. One or more weeks is then allowed for students to implement their plans; at the end of this time they report their results to the class. Particular attention is paid to the motivational techniques which seemed to work best and to the students' own feelings as they tried to persuade their friends and relatives. The activity concludes with a discussion of whether those methods which worked could be publicized and built into the government's campaign to promote safety belt use.

Two special considerations must be dealt with in conducting this activity. First, since it is likely that a majority of students in the class themselves may not use safety belts, it may be uncomfortable or hypocritical for them to try to persuade others to use them. One solution to this problem is for the students themselves to start wearing safety belts at least for the duration of the activity.

Also, it may be unwise to engage students or some students in school activities which involve attempts to persuade parents (or even friends and other relatives) to adopt safety practices which are being recommended in class. To overcome the sensitivity parents may have to pressures they may feel are being stimulated by the school to interfere with their private lives, you can take two precautions:

- Send a letter to parents before students engage in the unit of study describing the program and stressing the importance of inculcating safe driving habits in students.

- Indicate to the students that the activity is voluntary, and that they should not try to convince anyone else to wear seat belts unless they themselves are convinced of the appropriateness of their actions, *or* are convinced that it is important to learn how people can be motivated to change their behavior, *or* are convinced that it is an important learning experience for them to see how *they* handle and react to a real life situation in which they try to motivate someone to change their behavior.

Variations and Supplementary Activities:

Students can conduct the activity only by responding to the sample "Dear Abby" letters provided on the following pages and comparing their responses.

Students can rewrite the "Dear Abby" letters provided into story completion exercises which other students complete. Students can also develop original story completion exercises around a variety of interpersonal safety issues.

Students can mail one of their letters to the local newspaper and evaluate the newspaper's ("Abby's") response.

Sample "Dear Abby" Letters

Dear Abby:

My mother and father make me wear my safety belts all the time, but I've noticed that *they* usually don't wear them whenever they drive someplace without me or my brother and sister. I don't think this is fair, and I'm also concerned that if they get into an accident, they'll get hurt. What can I do to make them wear safety belts?

Signed,
Baffled

Dear Abby:

My sister never wears her safety belt. I've talked to her about it now and then, pointing out how people who wear them are not hurt as badly and get killed less often when they have accidents than people who don't. She used to say it was too much of a nuisance to wear them and they wrinkled her clothing. We haven't talked about it in over a year now, but last week her best friend was in a car accident in which she was badly cut and broke her ankle. She was not wearing a safety belt. I'm afraid that sooner or later my sister will be in an accident and get hurt. What can I do to persuade her to wear safety belts?

Signed,
Nervous

Dear Abby:

My cousin never wears his safety belt. He says he doesn't believe all the evidence the government has fed us about how they save lives and reduce injuries. He says you can't trust the government to tell the public the truth. He used to get very angry when I asked him to wear them, saying that the government has no business trying to make the public do things it doesn't want to do. He says it's up to the people to make their own decisions about whether to wear a safety belt. I'd like to get him to wear the belt because he's a pretty bad driver sometimes and has already been in two accidents in the past year, although fortunately he wasn't hurt. What can I do to persuade him to use his safety belt?

Signed,
Ataloss

New letters can be developed by altering the reasons given for not wanting to wear safety belts; the reasons given for wanting the other person to use safety belts; the relationship between the persons involved; and the safety (other than safety belts) involved.

MINI-UNIT 5

LEARNING ABOUT PEDESTRIAN SAFETY

Most people don't think of walking as a mode of transportation; it's just something we do. However when we walk in places where we compete with other modes of transportation, it becomes clear that safety considerations apply. It is important to learn what are safe and unsafe ways of walking, particularly in situations where pedestrians may be endangered by automobiles. Therefore, this mini-unit introduces students to the hazards people face as pedestrians and ways in which to cope with them.

The activities in this unit focus on rules for safe walking; precautions people can take to make themselves safer pedestrians; and peer pressure as it affects the safety of a pedestrian.

The concepts treated in this mini-unit include

- Rules are often necessary to insure safety.
- Safety regulations may be different for different groups.
- There are many things people can do to make walking a safe activity.
- There are many things that hinder pedestrian safety.
- Many people are affected by peer pressure.
- There are ways to resist peer pressure.

MINI-UNIT 5 LESSON PLAN

Learning about pedestrian safety

Activity #	*Activities*	*Class Time*
21	DESCRIPTION: Students conduct an experiment on group pressure and discuss why people exert pressure on others to walk and play unsafely and safely. OBJECTIVE: By the end of the activity, students will be able to define peer pressure by citing an example of both positive and negative pressure to walk safely or unsafely.	2-3 periods
22	DESCRIPTION: Students explore ways to cope with pressures to walk and play unsafely by responding to hypothetical letters from students. OBJECTIVE: By the end of the activity, students will be able to identify effective methods for resisting peer pressure in a given situation.	1 period
23	DESCRIPTION: Students discuss what restrictions they would set for children on walking and playing safely. OBJECTIVE: By the end of the activity students will be able to demonstrate knowledge of safe pedestrian practices by writing a safety book for young pedestrians.	1 period
24	DESCRIPTION: Students engage in one or more mini-activities on pedestrian safety. OBJECTIVE: After completing one or more of these mini-activities students will be able to identify and name at least two things they can do or be aware of to be better and safer pedestrians.	½-1 period

Total Class Time: 4½-6 periods.

ACTIVITY #21

Mini-unit Topic: Learning About Pedestrian Safety

Approximate Class Time: 2-3 periods

Capsule Activity Description: Students conduct an experiment on group pressure and discuss why people exert pressure on others to walk and play unsafely and safely.

Objective:

By the end of the activity, students will be able to define peer pressure by citing an example of both positive and negative pressure to walk safely or unsafely.

Concepts Treated:

- Peer pressure can be a powerful influence.
- Many people are affected by peer pressure.
- Peer pressure can endanger a person's safety.

ACTIVITY

The class conducts an experiment* in which five or more students are told in advance to claim, when asked, that a certain object of about a foot in length is between nine and ten inches long. It must be fairly obvious that the length estimated by these students is contrary to fact, but not absurdly so. One student who will participate is not clued in. He should be someone who will not be hurt by being a guinea pig.

Tell the class you are going to conduct an experiment to see if people agree on guessing the length of objects. Present the object and ask the students who have been clued in to estimate its length, recording the answers on the board. You should not ask the guinea pig his opinion until next to last.

---

*For the original experiment see S.E. Asch, "Effects of Group Pressure upon the Modification and Distortion of Judgements," in Eleanor E. Maccoby et al. (eds.), *Readings in Social Psychology*, pp. 174-183.

Presumably, the guinea pig student will want to offer a true estimate of the object's length but may be afraid of appearing foolish vis-a-vis the other estimates and so may repeat the exaggerated estimates of his classmates.

Discussion follows on why the student may have estimated incorrect length and how this may relate to peer pressure and pedestrian safety issues--for example, how people can be pressured into taking risks (e.g., playing near railroad tracks or in the street, walking on thin ice) because they don't want to seem foolish to their friends, just as the guinea pig student may have felt the length was twelve inches but didn't say so because he was concerned about appearing foolish to the class. Peer pressure can also be related to all other areas of safety--not just pedestrian safety. If this experiment does not work as planned and the guinea pig student gives a true estimate of the object's length, describe to the class what so often happens in situations like this and discuss why it may not have happened in this instance.

Next, students write brief responses to the following instructions:

> Describe two occasions on which you have tried to pressure a friend to do something. What did you do to pressure him? Were you with other friends? Why did you want him to do what you were pressuring him to do?

The following class period students break into small groups and are given instructions to

1. Read each other's papers.

2. Discuss and record, for each situation, why the pressure is being exerted.

3. Make a chart and list all the reasons why someone might pressure someone else to walk or play safely; to walk or play unsafely.

4. Discuss and record which, if any, of these reasons justify exerting pressure and which do not.

5. Discuss and record whether and how individuals who exert unjustifiable pressure can be discouraged from doing so and resisted.

Variations and Supplementary Activities:

The latter portion of the activity can be an oral rather than a written exercise and done as a class activity rather than in small groups.

Students can describe an incident in their own lives in which they were influenced by peer pressure or authority to perceive something incorrectly or express an opinion they didn't believe. Description should also include an explanation of why the pressure influenced them.

ACTIVITY #22

Mini-unit Topic: Learning About Pedestrian Safety **Approximate Class Time:** 1 period

Capsule Activity Description: Students explore ways to cope with pressures to walk and play unsafely by responding to hypothetical letters from students.

Objective:

By the end of the activity, students will be able to identify effective methods for resisting peer pressure in a given situation.

Concepts Treated:

- Peer pressure can be a powerful influence.
- Peer pressure can endanger a person's safety.
- There are ways to resist peer pressure.

ACTIVITY

Students explore ways of coping with pressures to walk and play unsafely by responding to hypothetical letters from various age students who are faced with such pressures.

Students break into small groups and each group is given a different letter (samples appear on the following pages). Groups are instructed to act as a consultant bureau. Each bureau must answer the letter with a letter of advice. If they disagree among themselves they may include more than one approach in their letter but they should write only one letter to the advice seeker.

When the groups have responded to their inquiries, the various bureaus exchange letters. Each group reads the original inquiry and response, and evaluates it in light of the following points: (1) the appropriateness of the response to the situation; (2) how effective the response would be if used in the situation; (3) would they, if confronted with a similar problem, be able to use the advice given? Why or why not? If the groups feel they can improve on the advice in any way, they are to do so.

Each bureau then explains to the class why it advised the particular course of action in the original response. The group that evaluated that response states its position and any changes.

The rest of the class is allowed to comment and ask questions throughout the explanation and evaluation.

Variations and Supplementary Activities:

Students can respond individually to the hypothetical letters and then compare responses.

Students can role play calling problems to a hotline.

Students can send in a "Dear Abby" letter to a local newspaper and evaluate the response.

Each student can write a hypothetical letter about a peer problem he or she is encountering. Students exchange letters and each student responds to one other student's letter.

Dear Abby:

I am 9 years old and my brother is 11. He is the safety patrol on our street. All the kids like my brother and I do too. My problem is that I don't thing my brother is a very good safety patrol. The other day he told my friends and me to cross the street. Just as we stepped off the curb a car came whizzing by and almost hit us. This isn't the first time this has happened either. If I tell my parents they will get mad at him. I don't want to get him into trouble. If I tell my teacher he will probably be taken off the safety patrol. He would just die if he couldn't be a safety patrol. It's hard for me to talk to my brother because he thinks I'm just a little kid. How can I help my brother do a better job so we all don't get killed?

Sincerely,

Worried

Dear Abby:

I don't live very far from school so I walk there and back home again every day. Lately a lot of trucks have been using the road I take to school. They go by really fast and its sort of scary because we don't have any sidewalks in our town and the trucks pass very close to you. I have gotten used to the trucks and have started walking out on the road again. The side of the road is often muddy and it's hard to walk there. My friend tells me it's dangerous to walk on the road with the trucks whizzing by and if I don't stop he's going to tell my mother. If he tells my mother she will be mad and start driving me to school like a little kid. But I also don't want to walk in the mud on the side of the road. What can I do so my friend won't turn me in?

Signed,

Leave Me Alone

Dear Abby:

My friends and I often play hide and seek near the railroad tracks. There are a lot of places to hide--the bushes are thick, there are holes to climb into, and nobody can see you. Last week when we were playing, I was hiding in a hole alongside the tracks. I heard a train coming but the game wasn't over. Nobody found me, so I didn't want to leave my hiding spot. The train went by my hole and, boy, was I scared. It was a good think it was a deep hole or I could have been hurt badly. I don't want to play by the tracks anymore because now I know how dangerous it is. But my friends are going to think I'm chicken and probably won't want to play with me ever again. What can I do?

Sincerely,

Scared to Death

Dear Abby:

My Dad and I go out jogging almost every evening. We usually jog about a mile or two and often don't get home until after dark. Several times recently cars have blown their horns at us. Once someone stopped and yelled at my dad and me to get off the road. Dad is a really great person but sometimes he's a little dumb. He likes to weave into the street and back to the side while he's jogging. He says it's good for his leg muscles. It might be good for his leg muscles, but it's going to be terrible for his legs when he gets hit. He also runs on the right-hand side of the road. He does this because watching the traffic coming at him is annoying and he can't concentrate on his running. I've tried to tell him that what he's doing is unsafe, but he doesn't seem to hear me. What can I do?

Yours truly,

Running Scared

ACTIVITY #23

Mini-unit Topic: Learning About Pedestrian Safety **Approximate Class Time:** 1 period

Capsule Activity Description: Students discuss what restrictions they would set for children on walking and playing safely.

Objective:
By the end of the activity students will be able to demonstrate knowledge of safe pedestrian practices by writing a safety book for young pedestrians.

Concepts Treated:

- Safety regulations may be different for different groups.
- Rules are often necessary to ensure safety.

Materials Needed:
Worksheets (see attached sample at end of activity).

ACTIVITY

At the beginning of class, students are given a worksheet instructing them to set rules for a son or daughter regarding pedestrian safety. A sample sheet is provided on the following page. Students break into small groups and are given instructions to

1. Read each other's papers.
2. Discuss and record on a blank group work sheet the best rule and punishment for each safety problem.
3. Justify your rules and punishments.

Groups report results to class and respond to comments and questions from the class. If it is not brought up, you may want to discuss why some punishments are more harsh or lenient for particular safety problems.

Variations and Supplementary Activities:

Class can role play parents and "defend" their rules.

Students can invite younger students to class to discuss the older students' rules.

Students can write the dialogue to scenarios in which a son or daughter argues over safety rules with his or her parents.

Worksheet

You are the parent of a __ year old (insert age) son or daughter. What rules, if any, regarding their walking and playing will you set? You may want to consider:

Safety Issue	*Rule*	*Penalty for Disobeying*
1. Playing in the street		
2. Walking or playing on or near railroad tracks		
3. Fooling around while walking		
4. Standing in street while waiting to cross street		
5. Not crossing at crosswalk or intersection		
6. Crossing the street against the light		
7. Running into street without stopping, looking and listening		
8. Walking on right hand side of street when no sidewalk available		
9. Not wearing reflective clothing when walking after dark		
10. Not obeying safety patrol or police officer		
11. Other (fill in)		

ACTIVITY #24

Mini-unit Topic: Learning About Pedestrian Safety **Approximate Class Time:** ½-1 periods

Capsule Activity Description: Students engage in one or more mini-activities on pedestrian safety.

Objective:
After completing one or more of these mini-activities students will be able to identify and name at least two things they can do or be aware of to be better and safer pedestrians.

Concepts Treated:
- There are many things that hinder pedestrian safety.
- There are many things people can do to make walking a safe activity.

Materials Needed:
See individual mini-activities for materials needed.

ACTIVITY

Student engage in one or more of the mini-activities on the following pages.

Walking to School

Using any media they desire, students make a map of their neighborhood indicating streets, sidewalks, traffic lights, stop signs, houses and stores. Students then decide the best way to walk to school and draw their routes on the maps. All students, whether they actually walk to school or not, can participate in this activity. They need only pretend that if it were possible for them to walk to school this is the route they would take. Students who live in the same neighborhood compare their routes and discuss what safety hazards are (or would be) encountered and what safety precautions must be taken while walking to school. Teacher may want to check on appropriate routes with school officials prior to activity.

What's Wrong Here

In small groups, students construct murals depicting a neighborhood, possibly their own, including streets, sidewalks, parks, schools, home and stores. Pedestrians are shown breaking pedestrian safety rules. Each group presents its mural to the class, explaining what actions are unsafe and indicating the correct behavior for each wrong act.

Variation: Groups construct two murals: one illustrating unsafe behavior, the other showing the correct behavior in the same or similar situations.

"Why Was I Born an Equestrian, I would Have Rather Have Been a Pedestrian"

Students write poems or songs using the word "pedestrian" as the theme. Poems may take any form you or your students desire. For example, students write the word pedestrian vertically on their paper. The letters begin the first work of each line of the poem.

> *P*eople are always in a hurry
> *E*verybody running to and fro,
> *D*oesn't anybody every stop to think
> *E*asy does it is the way to go.
> *S*till they rush off down the street
> *T*ramping through snow and rain,
> *R*unning helter skelter, never stopping
> *I*n and out of car and train.
> *A*nd although we try to tell them *Stop and Look*
> *N*obody really wants to *Listen*.

When making up words for a song about pedestrians, students will probably find it more fun and profitable to work in groups.

Poems and songs are read or sung to the class. The collection of pedestrian verse and song is bound and kept in the class library.

Safety Situations

Describe the following decision-making situations to the class and ask students to respond to them. Reasons for responses are then discussed. Students can create their own situations for each other to respond to accordingly.

Nightwalking: Suppose you have just finished eating a big dinner and are feeling rather stuffed. You decide to go out for a walk. You grab your jacket and start down the road in front of your house. There usually isn't much traffic on this road. Both cars that have gone by you have blown their horns. What must you be doing wrong? (Walking at night wearing dark clothing.)

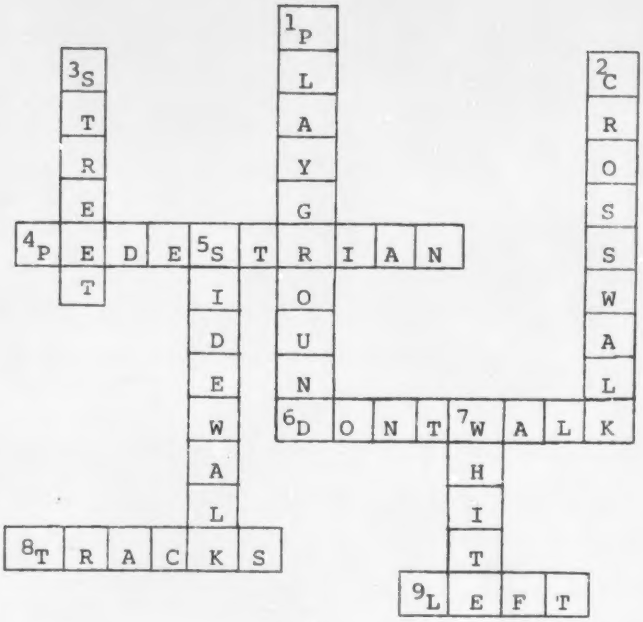
Walking with Friends: You and your friend have just left the movies. You run into another friend and the three of you start talking about the movie. You come to the corner and start across the street. There is a sudden squeal of brakes. What have you done wrong? (No one looked before crossing the street.)

Playing with Friends: Suppose you and your friends want to play baseball but the diamond in the park is already occupied. One friend says you can use the yard behind his house but he lives on the other side of town and nobody really wants to walk that far. Somebody suggests playing on the side street next to the park. What do you say?

Young Pedestrians: Suppose you are walking down your street and see a very young child playing in the yard in front of a neighbor's house. Suddenly the child starts to run after a dog that has appeared from behind the house. The dog is heading for the street with the child right behind him. There doesn't seem to be any adult around. What do you do?

Pedestrians and Bicyclists: Suppose you are waiting on the curb for the walk light to tell you it is safe to cross the street. The light says "WALK," you check the traffic which is slowing to a stop, and step off the curb. You are promptly hit by a person on a bicycle. Fortunately you are not hurt. What do you do?

Pedestrian Crossword Puzzle


1 PLAYGROUND
2 CROSSWALK
3 STREET
4 PEDESTRIAN
5 SIDEWALK
6 DONTWALK
7 WHITE
8 TRACKS
9 LEFT

Across

4. Wnat do you call a person who walks?

6. When it is unsafe to cross the street, the WALK light says ____________.

8. People should never walk or play near railroad _______.

9. When there is no sidewalk, on which side of the street do you walk?

Down

1. Don't play in the street, play your game on the _____.

2. The place where you cross the street is marked with white lines and is called a _____.

3. Another word for road is ____.

5. Most people walk on this. Kids play hopscotch and jump rope here.

7. When you walk at night, a good color to wear is __________.

Pedestrian Colors at Night*

Cut out equal size cloth letters or numbers of different colors such as white, bright orange, blue denim and non-reflective black. Tape four of each of the different colors at random on a dark wall or blackboard in a darkened room. Give a student a flashlight and instruct him or her to enter the room, shine the light on the wall and identify the first five letters or numbers seen. Do this several times and discuss the application of these experimental results to pedestrian clothing color while walking along a road at night.

Pedestrian Jacket Stickers

Cut light colored (preferably white) fabric into rectangular (5" x 10") shapes to use as a backing for the bumper stickers--one per student. Using reflective tape or paint, students write a brief message on the fabric.

SLOW DOWN

YOU'RE BIGGER--GO SLOWER

I'M A PEDESTRIAN

BE KIND TO PEDESTRIANS

The finished stickers can be sewn onto the backs of students' jackets, both to promote safety during the day and to aid students in being spotted by motorists when walking at night.

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*This mini-activity was developed for this activity by Don Bockler, Belmont, Massachusetts, a science teacher.

MINI-UNIT 6

LEARNING HOW TO BE SAFE WHILE BOATING

Water-based recreation is becoming more and more widespread. In today's affluent society, many families own boats and use them frequently. It becomes very important, therefore, for all members of the family to be aware of the basic rules of boating safety. To know how to swim is important, but it is not enough: you cannot save yourself by swimming in most boating accidents. In fact, trying to swim for safety is often the worst thing to do in an accident.

Boating safety is all the more important because there are as yet no licensing regulations that require a minimum age and basic skills before a person can drive or sail a boat. Each person's safety in a boat is still a matter of his or her own knowledge, skill, and prudence.

Major concepts treated in this unit are

- Safe boating requires certain standard equipment.
- It is important to know the proper behavior for safe boating.

MINI-UNIT 6 LESSON PLAN

Learning how to be safe while boating

Activity #	*Activities*	*Class Time*
25	DESCRIPTION: Students collect, look at, and handle various safety items that a boat is required to have and learn how to avoid common, unsafe boating practices. OBJECTIVE: By the end of the activity students will be able to demonstrate knowledge of safe boating practices by explaining the proper action to take in a given boating situation.	1-2 periods
26	DESCRIPTION: Students role play a family involved in a boating incident. OBJECTIVE: After completing this activity students will be able to tell what is wrong with a given unsafe boating situation and explain what should have been done to prevent this situation.	1 period

Total Class
Time: 2-3
periods.

ACTIVITY #25

Mini-unit Topic: Learning How To Be Safe While Boating

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students collect, look at, and handle various safety items that a boat is required to have and learn how to avoid common, unsafe boating practices.

Objective:

By the end of the activity students will be able to demonstrate knowledge of safe boating practices by explaining the proper action to take in a given boating situation.

Concepts Treated:

- Safe boating requires certain standard equipment.
- It is important to know the proper behavior to use a boat safely.

Materials Needed:

Safety items for boats (see list below), a low table, several benches or chairs.

ACTIVITY

If possible obtain safety items for boats or if students' families have boats, students might be able to bring in some of these items from home. Decide in class which student is going to try to bring in what, so you don't get too much of the same thing. Things that can be brought in are personal flotation devices (PFD)--various sizes (child, adult) and various kinds (life jacket, life vest); paddles; running lights--red and green; flashlights for signalling; whistles and horns; fire extinguisher; and marine radios (optional in small boats). Where possible and appropriate have the students use the safety items, e.g., put on the personal flotation devices or operate the radios to discover where the band with the weather forecasts is.

An option is to have a representative from the Coast Guard, the Coast Guard Auxilliary, or the State Boating Office lecture on the items and demonstrate their use.

Where items are too large or costly to bring in, the students can make drawings of them and describe their functions.

Next students learn proper boating techniques for the following situations:

Boarding (getting on)

Loading (putting things on)

Capsizing (boat tipping over)

Disembarking (getting off)

Unloading (taking things off)

Person Overboard (falling off)

To demonstrate proper behavior in these situations when using a small boat--rowboat, small sailboat, canoe, small motorboat--place a large but not too tall table at the front of the room to use as the dock. Small benches, chairs, or stools which are lower than the table are placed alongside. After you have described the appropriate behavior for each situation which is outlined for you later in this activity (you may also find the pictures at the end of this activity helpful to your students in understanding this behavior) ask for volunteers or choose several students to demonstrate the desired behavior.

The equipment gathered for the first part of this activity should be used here. Students may then practice wearing PFDs, loading the boat with actual equipment, and learn the proper way to rescue someone who has fallen overboard.

Boarding

1. The number of seats in a boat does not indicate the boat can carry that many people. Seats are arranged so a boat can be loaded evenly. The number of people a boat can carry is *less* than the number of seats.

2. Board boat one at a time.

3. Don't jump off dock--boat may tip over.

4. Step down slowly and gently into middle of boat.

5. Keep weight low and move slowly from dock to boat.

Equipment Loading

1. Don't drop equipment into boat. A person standing on dock passes equipment to person in boat.

2. If there is no helper, move equipment to edge of dock, board boat, then lift equipment off dock piece by piece.

3. Place equipment *evenly* in boat.

Behavior on a Boat

1. If the boat is improperly loaded, someone may fall off.

2. If someone is sitting dangling legs in water or in an unsafe position (crosslegged, on bow, on gunwales) or standing, even a small wave may cause him or her to lose balance and fall overboard.

Capsizing

1. A boat can capsize if it is overloaded or equipment or people are improperly loaded.

2. Capsizing is when a boat turns over and spills crew and equipment into water.

3. Stay with boat as long as it is floating--do *not* try to swim to shore. It's farther than you think.

4. If you are not already wearing a PFD, put one on.

5. Try to turn the boat rightside up and empty it of water, while floating alongside yourself.

6. If you can get the boat half empty then climb in--very carefully--and finish bailing.

7. Don't try too hard. Working in the water will make you very tired. If you can't get the boat upright and empty save your energy and signal for help.

Disembarking

Leave a boat in the same manner you board it--keep weight low, move slowly.

Unloading

Unload a boat in the same manner you load it--piece by piece and preferably with the help of a person standing on the dock.

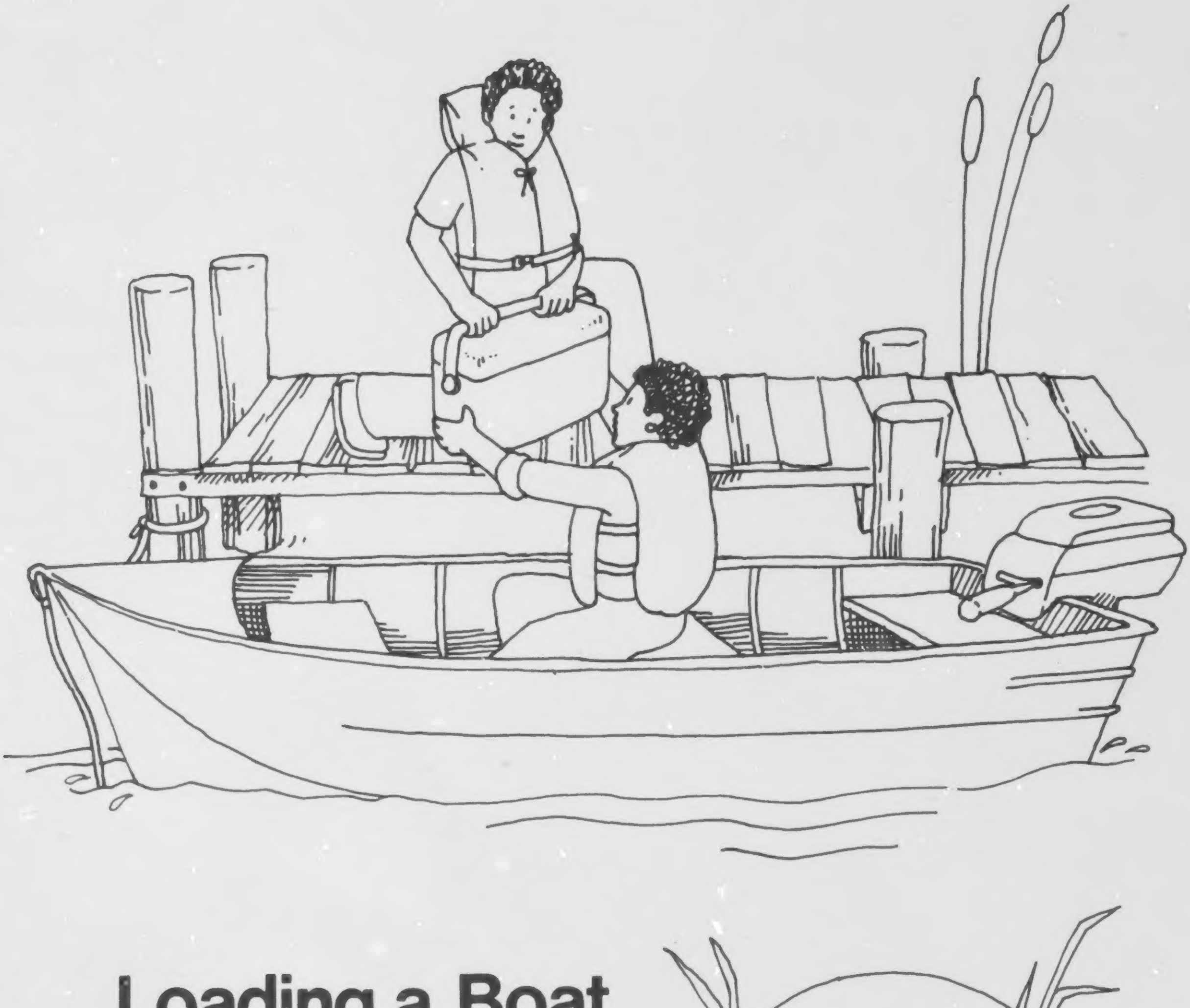
If Someone Falls Overboard

1. Call out "Person Overboard!"
2. Throw a buoy or cushion or ring buoy *near*--not at--person in water.
3. If you don't have such items on board, extend oar or paddle to the person.
4. *Never* take your eye off the person in the water.
5. *Never* dive into the water after the person.

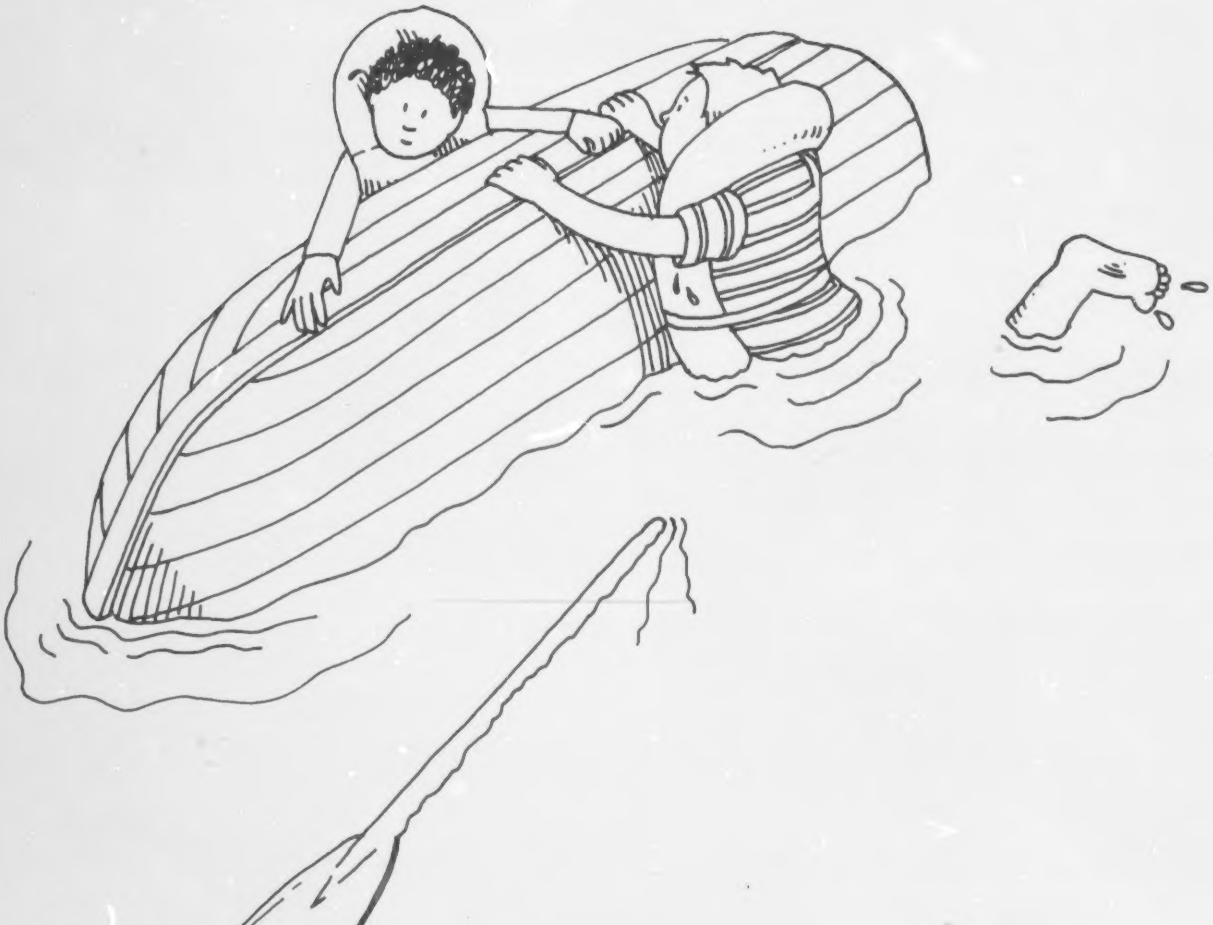
Things to Remember and/or Do Before Going Out in a Boat

1. Never go out without proper equipment, especially PFDs.
2. Learn to swim before you take up boating.
3. Go out with someone who knows how to operate the boat well.
4. Check the weather.
5. *Never go out alone.* If you must, leave a float plan--where you expect to go and when you expect to return.

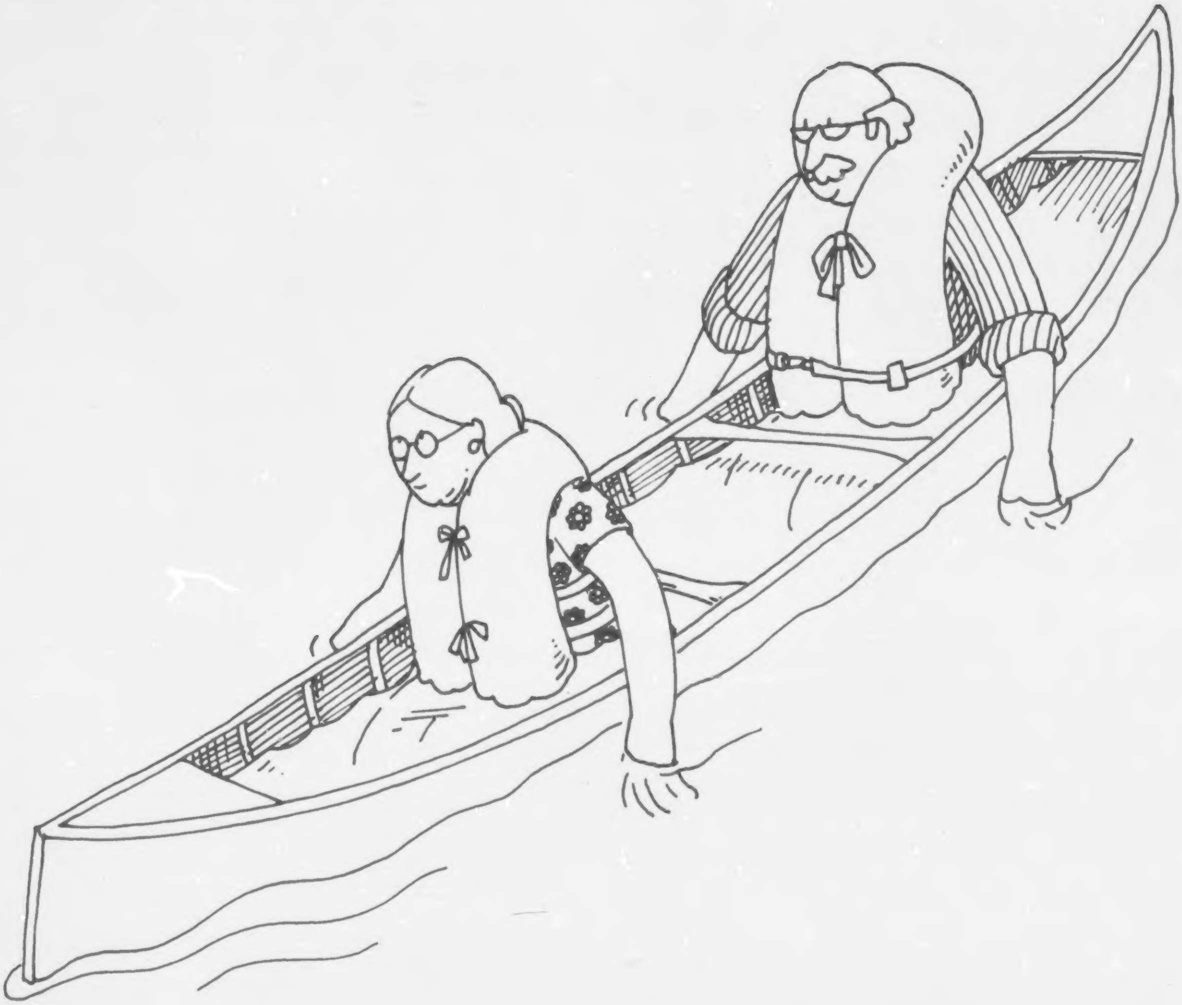
Safe Boating



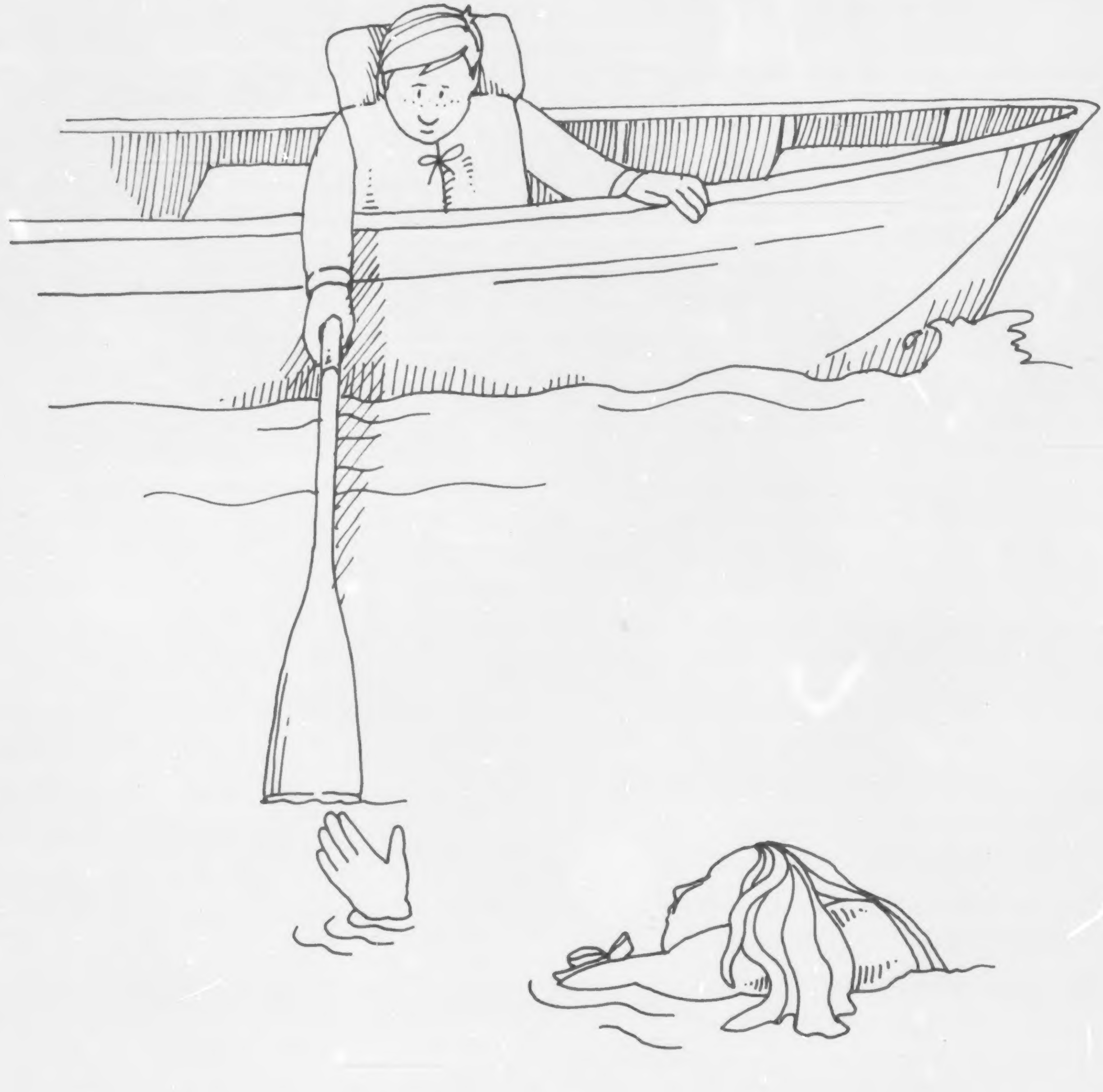
Loading a Boat



CAPSIZED BOAT – stay with it



Swamped Canoe



PERSON OVERBOARD-extend oar

ACTIVITY #26

Mini-unit Topic: Learning How To Be Safe While Boating

Approximate Class Time: 1 period

Capsule Activity Description: Students role play a family involved in a boating incident.

Objective:

After completing this activity students will be able to tell what is wrong with a given unsafe boating situation and explain what should have been done to prevent this situation.

Concept Treated:

- It is important to know the proper behavior for safe boating.

Materials Needed:

A low table, several benches and chairs.

ACTIVITY

Set up the front of the room as you did in the previous activity, adding two chairs to the left of and behind the dock.

Assign or ask for volunteers for parts in a boating role play: two children, mother, father. Send these students out of the room. Read all three role profiles (attached) to the class so they may have an overview of the role play prior to its being acted out. While you are reading the profiles, ask the class to think about how they would handle the situation if they were the children, and then again as the parents.

Bring the two students who are acting as the children back into the room. Tell them they are to act out the role profile as if they were the children being described. Read them the profile. The students act out their roles.

Next bring the mother and father into the classroom while the children are still in the boat. Tell them to sit on the two chairs (the automobile). They then act out their role profiles, simultaneously, after reading them silently to themselves (neither sees the other's profile) or after you have read them to each student one at a time without the other hearing.

At the completion of the role play, the class comments on its realism and then the whole group discusses some or all of the following points.

- Were the children doing anything wrong? Why or why not?
- What did you think of the children's behavior while in the boat? Safe or unsafe? Did they have the proper equipment with them?
- Why was the father worried?
- Did the parents act appropriately when they saw their children in the boat? If yes, why? If not, how should they have acted?
- How else could the children have retrieved their lost oar or have gotten to shore without it?
- How would you have acted if you were a parent?
- Do you think those children will ever go out in a boat alone again without first getting permission?
- Would you ever do what those children did? Why or why not?

Role Profiles

Two children

It's a hot day in July. The two of your have nothing to do this afternoon because your parents have gone to your cousin's wedding. Kids weren't invited. What a drag. Your father put the rowboat in the water this morning. He had promised to take you out for your first ride of the season but there wasn't enough time before he had to leave for the wedding. You don't see any reason why you can't go out wihtout him. You both rowed the little boat at least once or twice last summer with your father. It wasn't hard at all.

The neighbor next door is supposed to be watching you but she is doing a laundry right now. She won't even notice if you sneak off to the lake.

You take the oars out of the shed by the side of the house. You head for the dock where the boat is tied. Your father always made a big deal abou the proper way to act around boats. You decide that since you are doing something you could lose your allowance for, that you had best try to do things right while you're in the boat. Maybe then nothing will happen. Besides, if you're really careful, maybe you won't get caught or punished.

After you get in the boat all you have to do is put the oars in the oar locks, like that. Push off from the dock. And row. Nothing to it. Oh no! There goes an oar right out of the boat and into the water. It's even floating away.

Mother

You wish you could have found a better babysitter for the kids. Mrs. Cane always says she loves to sit for the children, but she really isn't very careful about watching them. Unfortunately you had no choice today but to ask her. You couldn't very well miss your own niece's wedding. You still can't help but worry about them. You'll be glad when you get home.

It's not far now. In fact, when you go around the next corner you'll be able to see the lake. No matter how many times you drive around that bend and catch that first glimpse of the lake, it still takes your breath away. To you, this is the most beautiful place in the world. And there it is again. The mountain looking down on the water. The pine trees hugging the shore. And oh no! Aren't those your kids out on the lake in the rowboat?

Father

You can't believe that you didn't warn the kids about not using that rowboat while you were at the wedding. How stupid could you have been? But they're good kids and they wouldn't do anything so dumb as to go out in the boat by themselves. They were, however, terribly disappointed this morning when there wasn't time to go for a quick ride. Maybe the oars are still in the basement in the back closet where they have been stored all winter. No--you remember taking them out and putting them in the shed when you came up two weeks ago to get the cottage ready for the summer. Of course Mrs. Cane is watching the kids so nothing could possibly happen to them.

It's a good thing you never mentioned to your wife that you put the boat in the water this morning. She would be a nervous wreck thinking the kids might have rowed off "into the sunset" or something. *Your* kids would never do a thing like that.

Well you're almost home now. Still you must admit you will be happier when you see the kids sitting in front of the television set.

There's the lake. Just another few feet to the driveway. Oh no! What are the kids doing in the row boat on the lake? And with only one oar!

MINI-UNIT 7

LEARNING ABOUT EMERGENCY VEHICLES

Students of all ages need to be aware of what emergency services are available if they are in serious trouble. At the same time, they must know how to obtain these services. Furthermore, they need to learn that when an emergency vehicle is traveling to where it has been called, someone's life or health usually is in danger.

Major concepts treated in this mini-unit include

- There are several different kinds of emergency vehicles used for different emergencies
- There are many emotions that must be dealt with in an emergency situation so one can act appropriately and effectively.
- Knowing whom to call for help is necessary if one is to act quickly and effectively in an emergency.

MINI-UNIT 7 LESSON PLAN

Learning about emergency vehicles

Activity #	*Activities*	*Class Time*
27	DESCRIPTION: Students identify the emergency services available in their community and the reasons for which each is used. OBJECTIVE: After completing this activity students will be able to identify the emergency vehicles in their community and describe the services each provides.	1-2 periods
28	DESCRIPTION: Students role play their reactions to household and community emergencies. OBJECTIVE: After completing this activity students will be able to demonstrate knowledge of appropriate emergency behavior. Given an emergency situation, students will identify the most appropriate person to call for aid and demonstrate how to do so.	1 period
29	DESCRIPTION: Students present skits depicting emergency situations. OBJECTIVE: After completing this activity students will be able to demonstrate knowledge of appropriate emergency behavior. Given an emergency situation students will write or orally describe their responses to the situation.	1-2 periods

Total Class
Time: 3-5
periods.

ACTIVITY #27

Mini-unit Topic: Learning About Emergency Vehicles

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students identify the emergency services available in their community and the reasons for which each is used.

Objective:

After completing this activity students will be able to identify the emergency vehicles in their community and describe the services each provides.

Concepts Treated:

- Some emergency vehicles, like fire engines, provide more than one kind of emergency service.
- There are different kinds of emergency vehicles for different kinds of emergencies.
- Each community has its own emergency vehicle.

ACTIVITY

Set the stage for this mini-unit by asking students to identify emergency vehicles and the services they provide in their community. You can amplify their comments, as necessary, with the following information. Emergency vehicle services refers to the provision of assistance to citizens through the use of vehicles when speed and special equipment are required to prevent or alleviate injury, suffering, or economic loss. Vehicles regularly involved in providing emergency services include ambulances, police cars, fire engines, helicopters, and Coast Guard rescue boats.*

Discuss the importance to the public of having quality emergency vehicles available by enumerating the instances in which such services are essential or valuable. For example, recent medical studies have shown that the care given to the injured or sick in the minutes immediately following an emergency is crucial to the chances of recovery. A recent U.S. Department of Transportation study stated that 23 percent of auto fatalities died of probably survivable injuries due to problems throughout the emergency care system. There has been growing concern in many communities over the wide variations in speed of response and quality of care that is available. In a matter of such serious personal concern, it is important for a potential user of this type of emergency service to be aware of the emergency care system in his community, and when and how to use it.

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*You may wish to expand this discussion using the illustrations of emergency vehicles found at the end of this activity. When showing the illustration of the ambulance you may want to ask your students if they know why the work "ambulance" on the front of the vehicle is written backwards.

Special mention can be made of the use by the public of the fire department for all kinds of emergencies, both appropriately and inappropriately. Many residents know that a call for an ambulance or police car may not produce help for as long as an hour (. . . there is a backlog of ambulance calls in the South Bronx, and we will have to wait forty-five minutes before one will arrive."--Dennis Smith, *Report from Engine Co. 82*). But turning in a fire alarm will always bring the fire fighters. ("The only real sure thing in this town (New York City) is that the firemen come when you pull the handle on that red box."--Dennis Smith, again). Young students need to be aware of both the reliability of this source of emergency help and the inconsideration and dangers of using it unnecessarily.

As a follow-up to the discussion, students in small groups or as a class research the availability and quality of various types of emergency vehicles in their community, including ambulances, police cars, fire engines, boats, and helicopters. Research can include one or more of the following methods:

- Brainstorming
- Seeking information from you or another teacher
- Interviewing appropriate community resources, including school nurse or doctor; family doctor; police officers; fire fighters; ambulance drivers; operators of ambulance services, including morticians; local government agency officials in departments of public health; and local Red Cross chapters
- Observing and examining ambulances, boats, helicopters, fire engines which are accessible in the community

Students can seek the following type of information about the availability and quality of services provided by each transportation vehicle:

Ambulance Service: Availability

Number of companies who provide service: __________

Number of ambulances in the community: __________

Number of companies providing 24-hour service: __________

Areas of the community without nearby service:

____

____

____

Number of companies providing immediate service in ten minutes or less: __________

Usual amount of time elapsing between request for ambulance and time of arrival: __________

Ambulance Service: Quality

Number of companies which provide emergency medical technicians with ambulance service: __________

Number of companies who provide attendants with first aid training along with ambulance: __________

Number of companies which provide in their ambulances

Oxygen: __________

Suction equipment (aspirator): __________

Two-way radio service: __________

Resuscitator: __________

Cardiac monitor: __________

Police Emergency Services: Availability

Location of nearest police stations:

____

____

____

Number of police cars available on each shift:

Day: __________

Evening: __________

Night: __________

Number of stations with police ambulances: __________

Total number of police ambulances available: __________

Police Emergency Services: Quality

Number of police officers with training in first aid: __________

Safety equipment provided in police cars:

Oxygen: __________

Resuscitator: __________

Suction equipment (aspirator): __________

Stretcher: __________

Blankets: __________

Basic first aid equipment (gauze, scissors, etc.): __________

Average amount of time elapsing between time of request for help and time of arrival at scene of emergency: __________

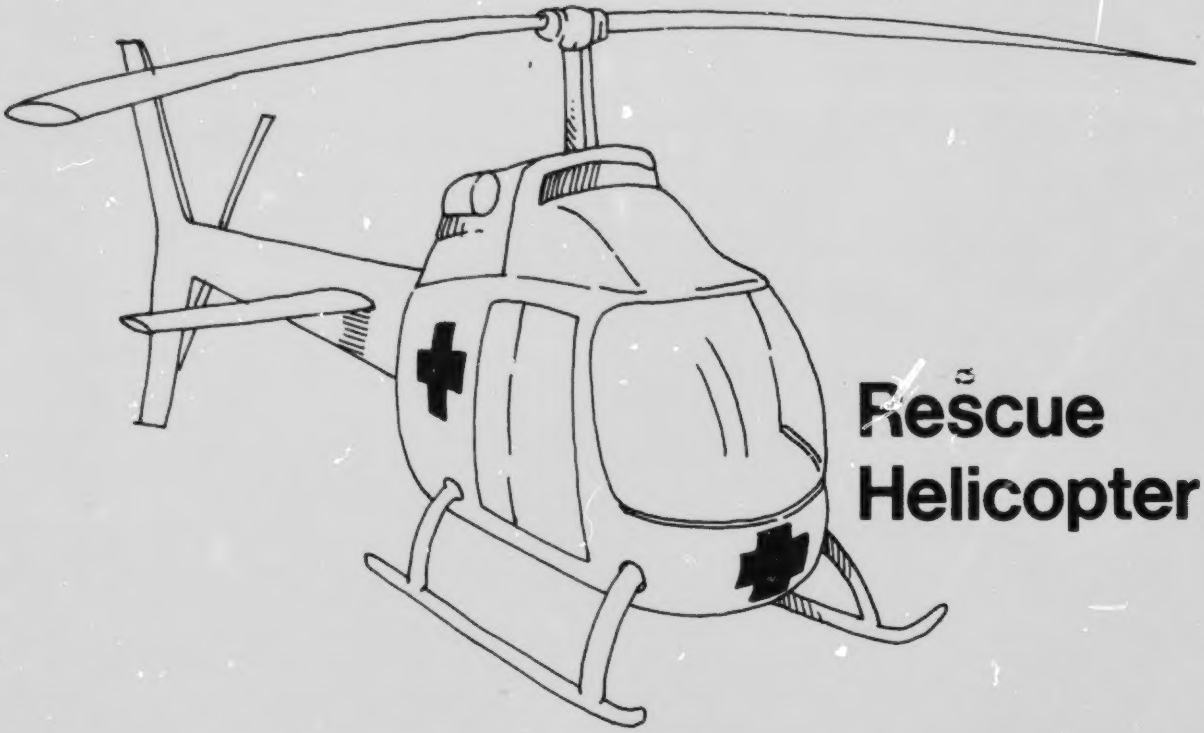
After determining availability and quality of emergency services, class discusses when to use each service and how to contact it. Generally the "when and how" of using emergency vehicle services depends on the availability and quality of services in the community rather than on any hard and fast rule such as "Always call the police for help in an emergency involving an injury." Whom to call will depend on who provides emergency services in a given community and which agencies provide the best care.

Variations and Supplementary Activities:

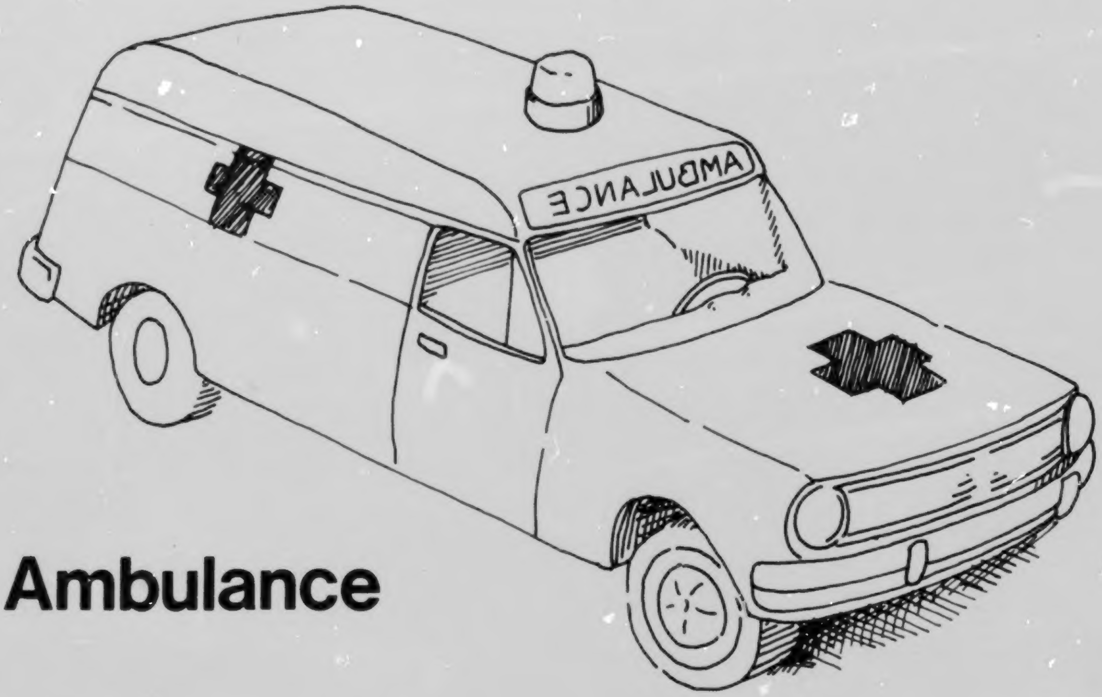
Class can divide into small groups with each group responsible for researching the nature and quality of a different emergency service in the community.

Students can write stories involving the absence of one or more emergency services--for example, describe what might happen in a town without fire engines, police cars, or ambulances.

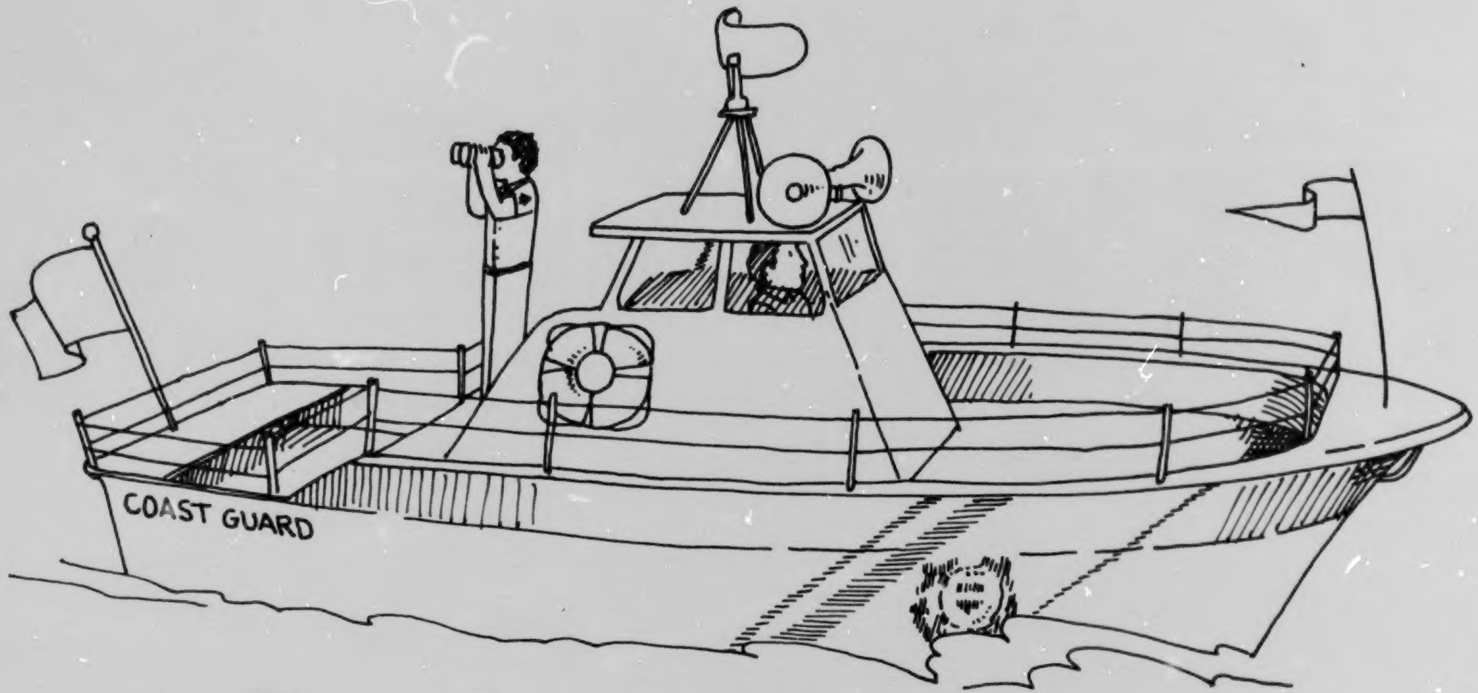
Students can develop a short brochure for use by other students and members of the community describing the emergency vehicles available in their community, when to use them, and how to use them.



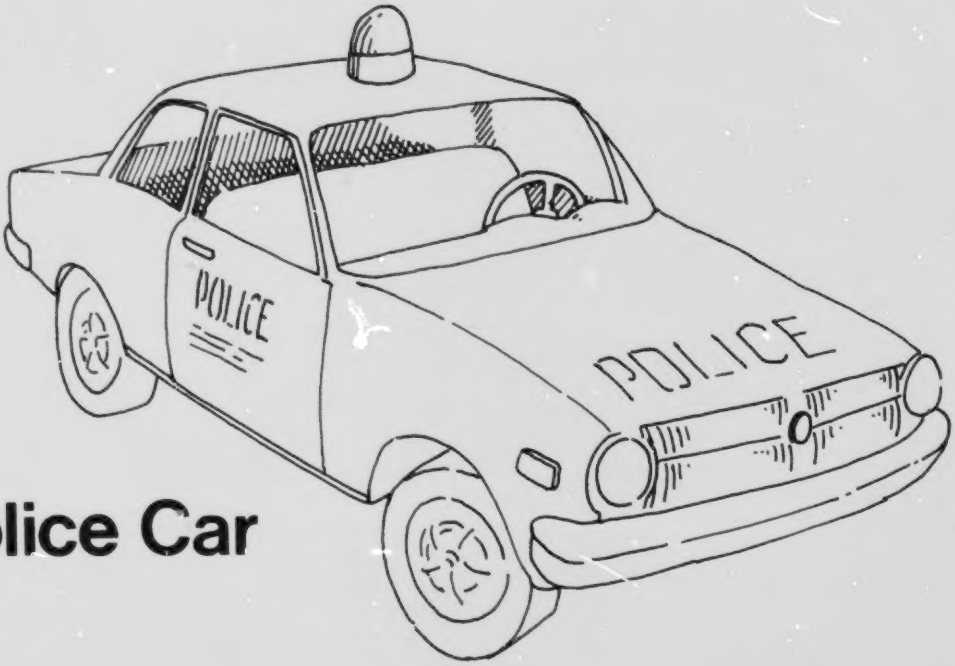
Rescue Helicopter



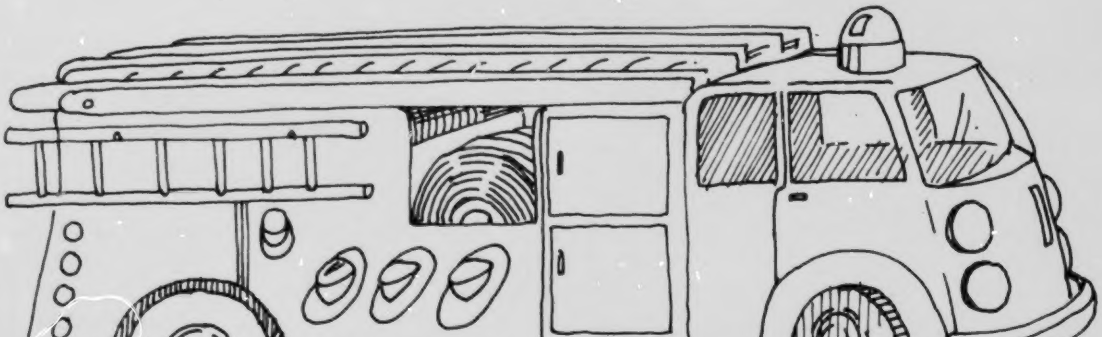
Ambulance


COAST GUARD

Coast Guard Rescue Boat


POLICE
POLICE

Police Car



Fire Engine

ACTIVITY #28

Mini-unit Topic: Learning About Emergency Vehicles

Approximate Class Time: 1 period

Capsule Activity Description: Students role play their reactions to household and community emergencies.*

Objective:

After completing this activity students will be able to demonstrate knowledge of appropriate emergency behavior. Given an emergency situation, students will identify the most appropriate person to call for aid and demonstrate how to do so.

Concepts Treated:

- There are many emotions that must be dealt with in an emergency situation so one can act appropriately and effectively.
- Knowing what to expect in an emergency helps a person to act more appropriately.
- Knowing whom to call for help is necessary if one is to act quickly and effectively in an emergency.

Materials Needed:

Play telephone, telephone directory or a list of emergency telephone numbers, crisis cards.

ACTIVITY

Discuss the following with the class:

- What is an emergency? Are there different kinds of emergencies?
- How do people feel (fear, panic, confusion, etc.) when they are involved in an emergency situation?
- What should a person do in an emergency? Discuss behavior and action to take in specific emergency situations.

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*Based on the game *HELP!*, Abt Associates Inc. (excerpted here by permission). Complete classroom kit available at $18.00 plus $1.50 shipping and handling from: Games Central, 55 Wheeler Street, Cambridge, Massachusetts 02138.

- What emergency vehicles and services are provided in your community and for what purpose? (Illustrations of the various types of emergency vehicles can be found at the end of Activity #27.)

To reinforce appropriate emergency behavior, play the game that is described below:

One at a time students are called to role play their reactions to household emergencies, using a telephone and directory as props. The rest of the group will be an audience of critics, who evaluate how well the emergency was met and make impromptu suggestions.

Shuffle the Crisis Cards [samples include two role profiles pertaining to fire (Cards #1 and #2), two pertaining to police (Cards #3 and #4), and three to emergency crisis situations* (Cards #5, #6, and #7)]. The student who is it leaves the room to stand just outside the door or some other safe place out of hearing.

Draw the first random card and read it to the group. You may wish to briefly discuss or embellish the situation prior to bringing the role-player back into the room. In no way, however, should the nature of the crisis be changed, but it may be made more realistic for the role-player.

Call the student back into the room, have him or her take the stage, and read the crisis aloud. Tell the role-player to go through all the motions of his/her response to this emergency, paying particular attention to the sequence of actions and the clarity, conciseness, and comprehensiveness of his/her verbalizations. When the student has completed the role play, ask the class to comment on it relative to these same points.

CRISIS CARDS

After spending a hard day playing with your friends, and being the winner of the game, you start for home. You want to play again next week to show everyone that you really are the big winner, and there is no one around who can beat you. But you have a week to rest up. As soon as you walk in your house, you hear the water running in the bathtub. Taking a bath is not what a champion should have to do. But your mother seems to feel that you are dirty, and being the winner has nothing to do with that. So into the bathtub you go with your little brother (sister). You get the soap first and wash fast, so you can get out of the tub first. You leave your brother (sister) in the bathtub. You have just put on your bathrobe when you here a lot of splashing and coughing coming from the bathroom. You go to open the door and find it is locked. (But you didn't lock it when you finished your bath.) You call for your mother. There's no answer. She must have gone next door for a minute. You call your brother's (sister's) name, but you don't hear anything. Is he (she) all right? Is he (she) not answering on purpose? You don't really know. What should you do now?

---

*If your community has a Poison Control Center you may want to explain its function to the class and how they can use it in particular emergency situations like the one described in Crisis Card #6.

You have been watching a trash truck take in all the things that people have thrown away. It doesn't look as if that truck could hold all the trash from the cans. But by the time the truck leaves your street, there is no trash to be seen anywhere. You watch the man next door come running out of his house, trying to get the trash truck to come back. The man looks angry. He goes back into the house and returns, bringing out four cans of trash and lights the pile with a match. Black smoke starts to rise from the pile of trash. Your neighbor sees this, but he just turns and walks back into his house. It doesn't smell very good to you. Suddenly the fire spreads to some leaves in the gutter. No one is home because your mother has gone to the corner store to buy some odds and ends. No one else is around. What should you do about this?*

You have never heard the sort of noises from next door that you hear tonight. Not only are your neighbors yelling at each other louder than ever, but you begin to hear things breaking. All the time they are throwing things at each other, they continue to yell. If they keep this up, they will wake up your little brother (sister). Tonight you are baby-sitting because your mother couldn't find anyone else to come. (She said she would only be gone for about two hours.) You don't want your little brother (sister) to wake up because then he (she) will start to cry. Just as you decide to go next door to ask them to shut up, you hear the woman scream, the door slam, and footsteps running away. You are afraid that something terrible has happened next door, but you are afraid to go and look. What do you do now?

Some new animals have just arrived at the city zoo. You especially want to see the rhinoceros from Africa. You have heard that they sleep a lot, so you want to get there early and wait around until it wakes up. You meet your friend on the corner and you both start walking towards the zoo. You come to a street corner where there are four stop signs. Someone is crossing the street coming towards you. Out of nowhere comes a car, going very fast. You hear the squeal of brakes. The person who had been crossing the street towards you and your friend has been hit and knocked down by the car. And the car didn't even stop! The person is still lying there in the street, and no one seems to be around except for you and your friend. What do you do now?

---

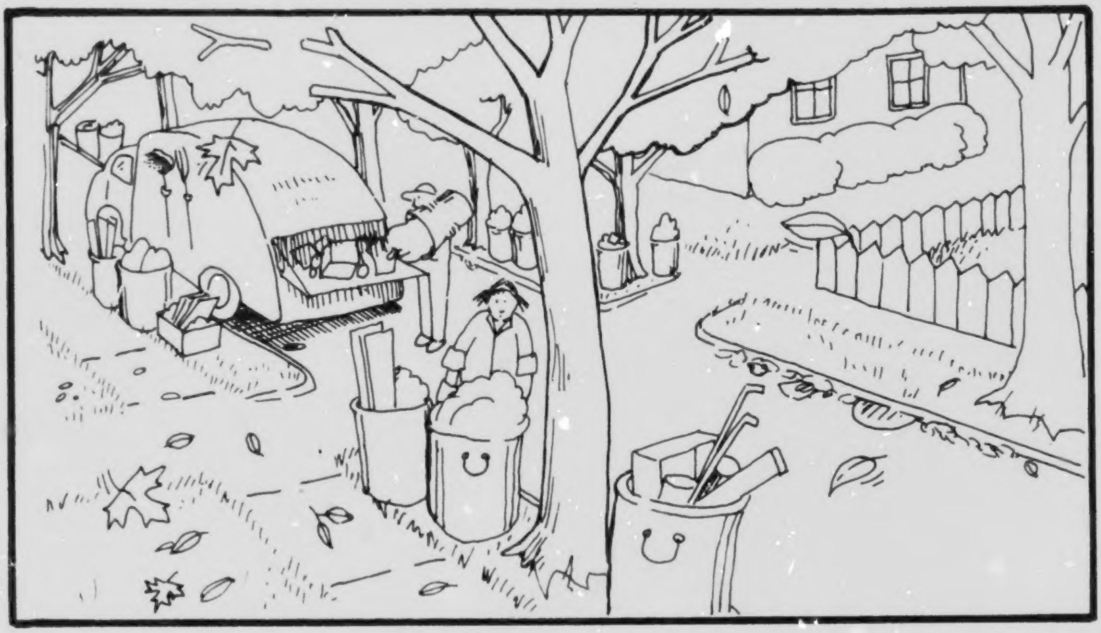
*This role profile is illustrated at the end of the activity. You may wish to have students react only to the illustrations provided or to some appropriate combination of illustrations and written role profile.

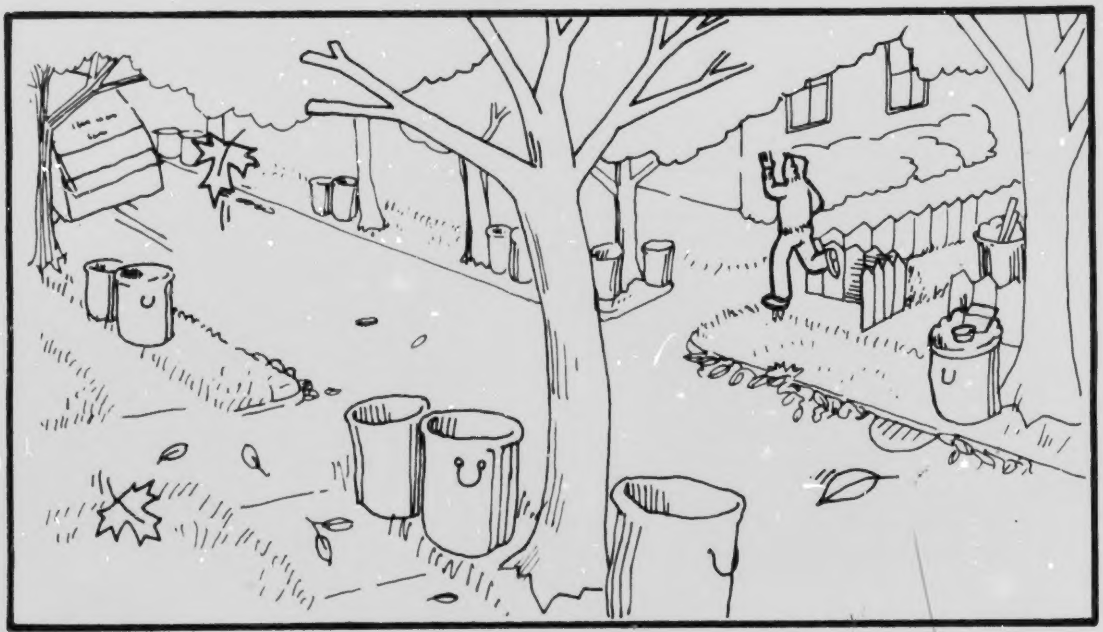
You see that still another day has gone by and no one has discovered your secret hiding place. All the things you love that your mother won't let you keep in the house are buried in the ground here. Today you are adding something new to your collection. You smooth over the ground after covering up the hole you dug. No one could ever guess that your treasures are here. You just hope that it doesn't rain. That might wash away the dirt, and your treasures won't be covered any more. With that done, you head on home. You notice something large lying in the street. It isn't moving. As you come closer you notice that it is a person! Doesn't he have a bed to lie in when he is tired? But that can't be it. It isn't dark yet. You see the old man holding his hands over his chest. Is he sick? What should you do now?

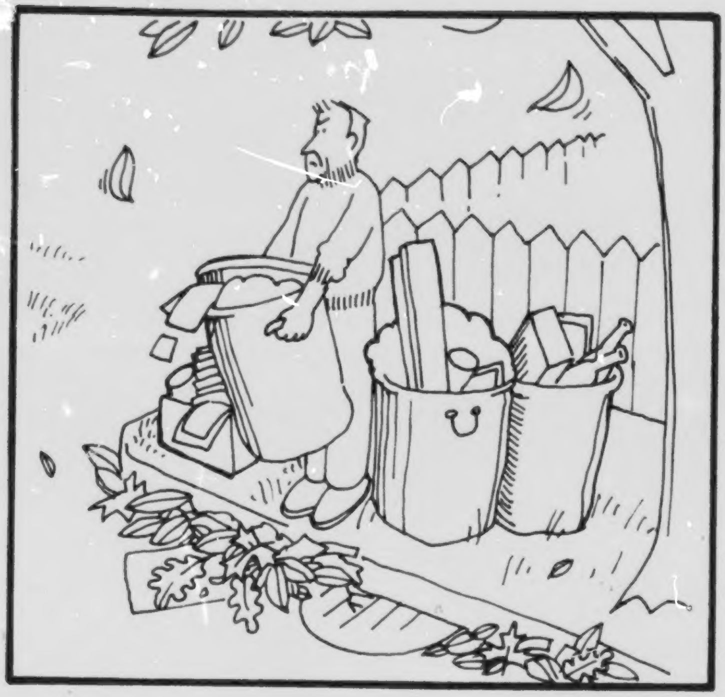
Spring has finally come. The flowers are blooming and the birds are singing in the trees. You can go outside without a jacket now, and you can play longer because there is more light. All the snow is gone from the roofs of houses and from the streets. But spring also means that it is time to clean the house, and you are old enough to help. All the things your mother needs for cleaning are set out. If only your little brother (sister) would take a nap so you can clean what you are supposed to. He (she) keeps getting in your way. Your mother has gone out to buy some sponges so you can help her. Now you are using her sponge in the kitchen. All of a sudden you hear loud crying coming from the bathroom. You rush in to find your little brother (sister) holding a bottle of ammonia. It is only half full now, and you know your mother had just bought it. What do you do now?

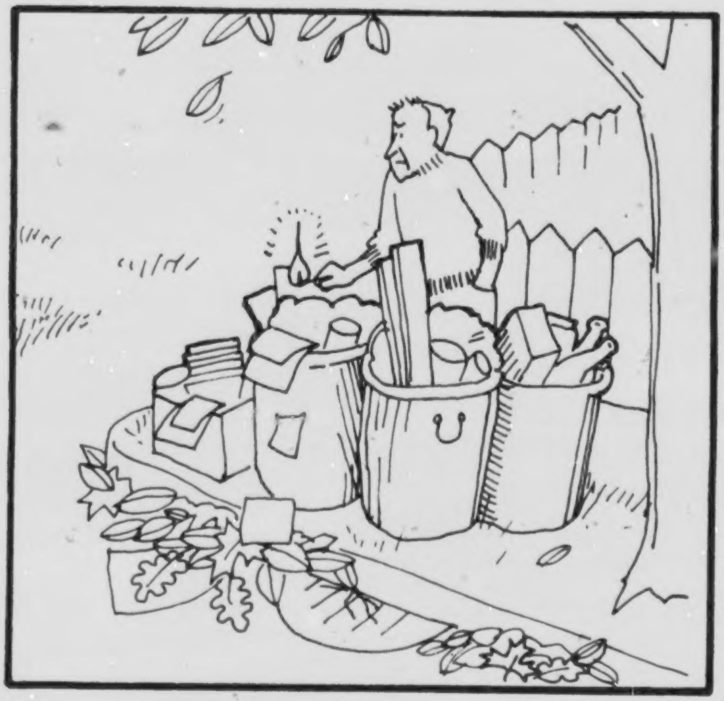
How many times must you tell your mother that eating lettuce makes your stomach hurt? And how many times has your mother said that unless you eat the vegetables first, you won't get any ice cream? You've tried holding your nose when you have to eat the lettuce, but that doesn't seem to help either. And your mother isn't very happy when you do that. So there you sit, watching your mother cut up the vegetables for dinner. You hope she'll finish soon, so maybe there will only be enough for her. Suddenly the knife slips. Your mother has cut her hand badly. She puts her hand under the cold water in the sink, but the bleeding doesn't stop! How can you help her? She can't even dial the telephone, with that cut on ther hand.

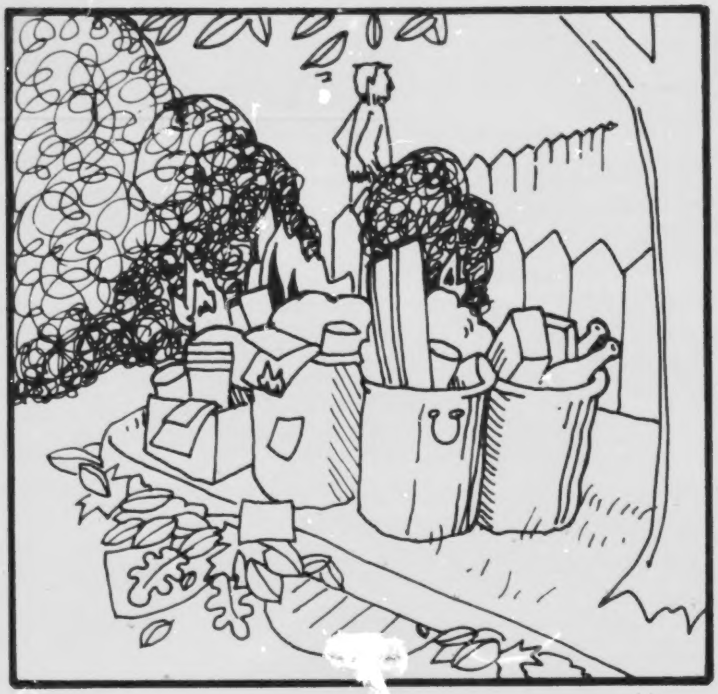
WHAT'S GOING ON HERE?

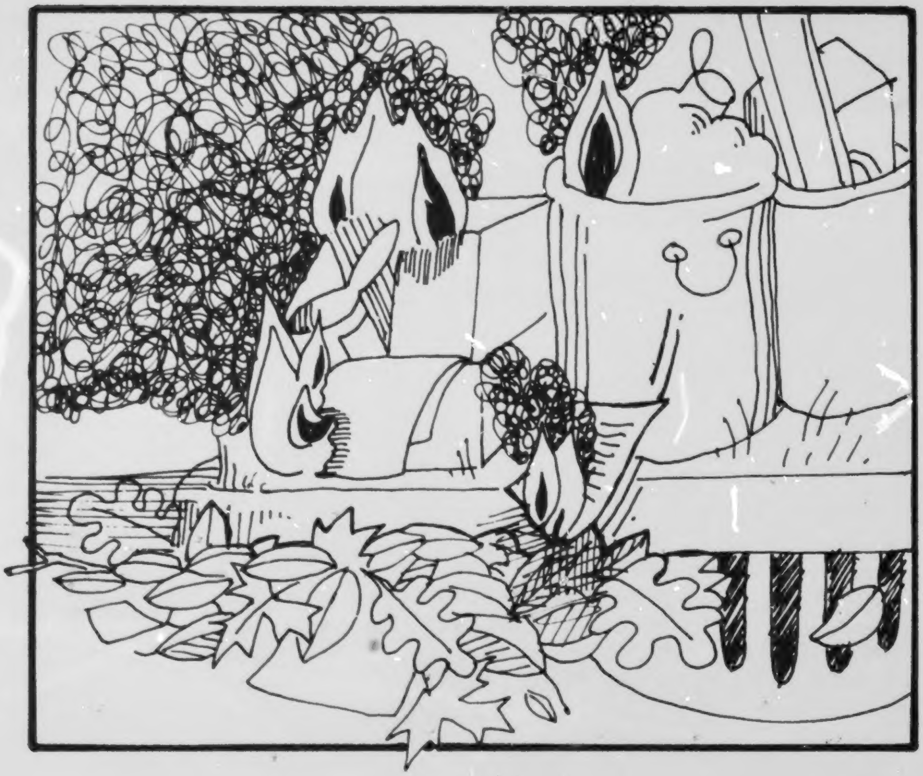












WHAT SHOULD YOU DO ABOUT THIS ?

ACTIVITY #29

Mini-unit Topic: Learning About Emergency Vehicles

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students present skits depicting emergency situations.

Objective:

After completing this activity students will be able to demonstrate knowledge of appropriate emergency behavior. Given an emergency situation students will write or orally describe their responses to the situation.

Concepts Treated:

- There are many different kinds of emergencies.
- There are many ways of dealing with emergencies.

ACTIVITY

Break the class into small groups of three to five students to discuss emergencies that they or members of their family have had to deal with. (These emergencies can range anywhere from a fire to a bad cut.) After each student has explained his or her situation to the group, the group chooses one emergency to present as a skit to the rest of the class.

The student whose situation was chosen acts as director to ensure that the skit will be true-to-life. If there is a need, the emergency may be elaborated upon slightly, so all members of the group have an opportunity to participate in the skit. However, it should not be altered so much that the actual situation and circumstances are changed drastically or lost.

Each skit is performed twice. The first time it is enacted as it actually happened. The second time, the students present it as they think it should have happened, paying particular attention to portraying more appropriate emergency behavior; and contacting the most appropriate source of aid for the particular situation.

If a group feels the actual situation was carried out appropriately, students defend the action taken. Otherwise, at the completion of the second performance, the group explains the mistakes it felt were made initially, and why and how the action it took was more appropriate to the situation.

The class discusses each group's handling of its emergency, making appropriate comments, criticisms, and suggestions.

It should be stressed at the outset of this activity that people react in various ways to emergencies--some people are very calm, others are unable to function at all, but most try to respond to such situations to the best of their ability. Remind students that although they are reacting to real-life emergencies, they are doing so without the added stress of various emotional factors. However, by performing these skits, they are becoming aware of the best way to respond to an emergency and should be better able to cope with a similar situation should it ever arise.

Variations and Supplementary Activities:

Students can write role plays illustrating circumstances leading to an emergency. Students react to the situations and respond accordingly.

Students can compile a pamphlet describing what to do in various emergency situations.

MINI-UNIT 8

LEARNING ABOUT SAFE TRAVEL BEHAVIOR

The preceding mini-units have dealt with automobiles, pedestrians, boats, and emergency vehicles. However, those are not the only forms of transportation that people use which involve their safety. This mini-unit deals with other forms of travel, stressing that all have their special hazards but all can be used safely if certain rules are followed.

Among the major concepts treated in this unit are

- There are many different kinds of transportation which we use regularly in our daily lives.
- There are safety precautions to take or remember for each kind of travel.

MINI-UNIT 8 LESSON PLAN

Learning about safe travel behavior

Activity #	*Activities*	*Class Time*
30	DESCRIPTION: Students develop stories about transportation safety to present to lower grade classes. OBJECTIVE: After completing this activity students will be able to name three kinds of transportation, one hazard associated with each, and one safety precaution to take with each.	3-5 periods
31	DESCRIPTION: Students take field trips to railroad crossings or subway stations to observe precautions they and others should take regarding rail safety. OBJECTIVE: By the end of the activity, students will be able to recognize a safe rail crossing. Students draw a picture of a safe rail crossing and identify the safety features.	2-3 periods
32	DESCRIPTION: Students play a card game and a board game which teach the difference between safe and unsafe travel behaviors. OBJECTIVE: After playing one or both games, students will be able to name three unsafe travel behaviors and the corresponding safe behavior.	½-1 period

Total Class
Time: 5½-9
periods.

ACTIVITY #30

Mini-unit Topic: Learning About Safe Travel Behavior

Approximate Class Time: 3-5 periods

Capsule Activity Description: Students develop stories about safety to present to lower grade classes.

Objective:
After completing this activity students will be able to name three kinds of transportation, one hazard associated with each, and one safety precaution to take with each.

Concepts Treated:

- There are many different kinds of transportation which we use regularly in our daily lives.
- Safety must always be a factor to consider when traveling.
- There are safety precautions to take or remember for each way we travel.

ACTIVITY

Divide the class into small groups of four or five students. Each group develops a story based on transportation safety. The stories can be about any kind of transportation but all must in some way relate to safety. The stories can be written in various forms. For example, they can be in play form, developed as a rebus story, or styled after a television commercial. As an example of the type of story students can develop, you might read aloud the story which is included at the end of this activity. (This story employs a fill-in-the-blank format.) When the stories are completed, they are presented by their authors to lower grade (K-3) classes.

To prepare for the presentations each group can perform its story for fellow classmates. Prior to these trial runs, groups formulate follow-up questions to ask the audience about the stories. Examples of such transportation safety questions for the story *Andrea's Trip* follow:

Automobile: What are some of the things you should remember to do when riding in a car? Should everybody wear a safety belt? Do you think everybody does wear them?

Fire Engine: How do fire engines help us? How can we help people who drive them?

Airplane: Why do people wear seat belts on an airplane?

Bus: Should we be aware of our safety when riding on a bus? Why or why not? What might have happened if the bus Andrea and her family were riding on was very crowded--people standing in the aisles--and the driver suddenly slammed on the brakes?

Elevator: What could possibly be unsafe about an elevator? What do you think Andrea would have done if on one of her trips to the hotel basement she got stuck in the elevator by herself?

Boat: What might be a good thing to know how to do before taking a boat ride?

Bicycle: Can a bicycle ever be a dangerous vehicle? Why or why not? Should Andrea's father have checked his bicycle before going on the trip? Why? What should he have checked for?

When the groups feel comfortable with their stories and questions, presentations can be made to other classes. If possible each group should present its story and follow-up discussion questions to a different class.

Variation or Supplementary Activity:

Break students into groups. Give one student in each group an idea for a story which he or she starts. One at a time the other students in the group build on the story or idea of the preceding student. A tape recorder might prove helpful and fun for the story projects. Tapes can be exchanged among the groups and students discuss each other's stories.

Andrea's Trip

Instructions to students before reading story:

You are going to hear a story told with words and sounds. In several places something has been left out of the story and replaced with the sound it makes. There will be a pause in the story after each sound. Call out--but softly please--the name of the vehicle or thing you think makes that sound

I will write the name of the vehicle or thing on the chalkboard as you call it out. Before we start, I'll show you what we mean.

> Dad and I were driving in the car one day, when all of a sudden we heard a siren behind us. I was sure it was a police car, but when I turned around I saw a police officer on a ____________(motorcycle).

That one was easy.

Let's see how well you do with the story.

Dear Diary:

It has been a long time since I have written in you, but I have been very busy. I have been on vacation with my Mom and Dad, and my sister Sylvia. We are back home now and I want to tell you all about the terrific vacation we had in Canada.

Last Saturday morning the whole family was awake at 5:30. We had to get up that early because we were supposed to be at the airport at 7:30. We got dressed, had breakfast, and carried our suitcases out to the garage, where we all got into the __________(car) for the trip to the airport.

On the way to the airport, we spotted a lot of smoke in the sky. Just as we were trying to guess where the smoke was coming from, two __________(fire engines) went by and turned off the highway at the next exit. As we got to the top of the hill, we could see a building, not far off the road, burning. The fire looked pretty bad. I was glad the fire engines were on their way to put it out.

When we got to the airport, we went right to the terminal and gave our luggage to the baggage attendant. I liked watching the suitcases move along the ramp all by themselves, then disappear through a little door in the wall. By this time, though, I was so excited I could hardly stand it--I thought we would never be allowed on the __________(plane). It seemed like we had been waiting forever. Finally the doors opened and we were told we could board the plane. Almost the first thing I noticed when I sat down in my seat was a funny clicking sound all around me. It wasn't until I saw the little sign over my seat which said __________(fasten seat belts) that I figured out what it was.

Takeoff was exciting and I really liked flying above the clouds. I guess we were going very fast but I could hardly tell if we were moving at all. Sylvia and I played cards, and looked at magazines, and made friends with the kids sitting in front of us. Before I knew it, the little sign over my seat came on again telling me to __________(fasten seat belts). I knew we would be landing soon.

Mother was very pleased with Sylvia and me. We had only one *small* fight on the plane, but other than that we were "perfect children" as Mother likes to call us when we are exceptionally good.

After we found our suitcases, we followed Dad outside where we waited with a bunch of other people for a ride to our hotel. When the __________(bus) pulled up we were the first to get on so we were able to sit right behind the driver. The ride to the hotel was very short because we were on an express bus. I think that's a bus that doesn't make very many stops. I have a feeling that Dad thought the bus ride was a little too short, because he kept leaning forward in his seat to tell the driver to slow down. The driver must have had a hearing problem because he never answered Dad, and he didn't slow down much either.

The hotel we stayed in was really neat and really big--20 stories tall. Our room was on the 15th floor. Sylvia thought we would have to walk up 15 flights of stairs to get to our room. She didn't think she could carry her suitcase that far. Just as she was making a big fuss about how heavy her suitcase was, a door in the wall behind her opened and we all got on the __________(elevator) and rode up to the 15th floor. Sylvia was very relieved.

The first afternoon we spent in Canada, Mom decided it would be fun to take a ride around the harbor. Sylvia and I changed into our shorts, Mom grabbed the camera, Dad made sure he had his wallet, and off we went. We found the pier easily and got right on the __________(boat). The boat took us all around the harbor and even served ice cream. I had a chocolate cone and Sylvia had vanilla. But the best part of the boat ride was when we went under some railroad tracks that crossed the water and a __________(train) was going by at just the same time.

The next day Mom thought it would be nice to explore the countryside. She suggested we hike out to a nearby lake, but Dad thought it might be more fun if we rented bicycles and rode there. We had a great time on the way out, but on the way back Dad's bike got a flat tire. Boy was he mad. All the way home he kept saying, "Why didn't I check the tires? Why didn't I check the tires?" I don't think he'll ever again forget to check the tires.

One of the best things that I did by myself was to take the __________(elevator) down to the hotel basement to watch the big __________(truck) back up to the building to deliver food for the hotel restaurant. I had never seen so many carrots and tomatoes and oranges and heads of lettuce in my whole life. And I never knew people could eat so much food.

The rest of the week we spent swimming and hiking and sightseeing. But we didn't do any more bike riding. We had a good time. Dad even got over his flat tire and had fun. I wasn't bored once and nobody had any big fights. I hope we can go back to Canada again sometime.

Love,

Andrea

ACTIVITY #31

Mini-unit Topic: Learning About Safe Travel Behavior

Approximate Class Time: 2-3 periods

Capsule Activity Description: Students take a field trip to railroads, railroad crossings, or subway stations to observe precautions they and others should take regarding rail safety.

Objective:

By the end of the activity, students will be able to recognize a safe rail crossing. Students draw a picture of a safe rail crossing and identify the safety features.

Concepts Treated:

- Railroad crossings and subway stations can present safety hazards.
- There are precautions to take when around rail or subway tracks to ensure safety.

ACTIVITY

Begin this activity by identifying and discussing as a class some of the hazards of trains and subways and some of the safety aspects of both. Some of the things you can discuss include

1. What barriers exist to prevent cars from crossing railroad tracks when a train is approaching?
2. What kind(s) of warning(s) is/are given to drivers and pedestrians?
3. Is this warning easy to understand?
4. Can pedestrians, bicyclists, or cars get around the barriers and are they likely to be tempted to try?
5. In subway stations, are there barriers preventing people from crossing one side of the tracks to the other except when it is safe?

6. Is there anything in subway stations that prevents people from standing too close to the trains as these vehicles come into the station?

7. Are conductors careful to make sure all passengers are on board before the train starts?

Students may not know the answers to many of these questions. You may wish to discuss them only briefly with the class at this time, waiting to have them answered in more detail on the field trip described below.

Next, divide the class into small groups of three or four students. Each group makes up four to six questions it wants answered about railroads/subways and track crossings on the field trip. At least two of the questions should relate to safety. The groups present their questions to the class. Duplicates are discarded and all questions are discussed for appropriateness. Enough questions are retained so each group has at least two questions to ask of the field trip speaker or guide.

Following the trip, students discuss what they saw, agree on any safety hazards encountered, and develop recommendations for remedying them.

Variations or Supplementary Activities:

Students can discuss why freight yards and railroad tracks are so appealing as play areas, and why some children enjoy throwing rocks at trains and buses. Class can also identify what steps are taken and should be taken to prevent or discourage children from playing in freight yards and on railroad tracks and from throwing objects at trains and buses.

If a field trip is not possible, students can research the answers to the questions they developed in their groups, or they can send their questions to a railroad or subway official to be answered by mail.

ACTIVITY #32

Mini-unit Topic: Learning About Safe Travel Behavior

Approximate Class Time: ½-1 period or free time activity

Capsule Activity Description: Students play a card game and a board game which teach the difference between safe and unsafe travel behaviors.

Objective:

After playing one or both games, students will be able to name three unsafe travel behaviors and the corresponding safe behavior.

Concept Treated:

- For every unsafe travel behavior, there is a corresponding safe behavior.

Materials Needed:

Playing cards, game board (provided at end of activity), playing pieces (e.g., buttons, erasers, chalk, pebbles).

ACTIVITY

Card Game

This card game illustrates people in situations which they may or may not realize are unsafe and asks students to match the unsafe behavior card with the card illustrating the more correct and safer behavior in the same or similar situation. For example, children playing in the street and children playing in a playground would be a matched pair. The student who has the most correctly matched pairs at the end of the game is the winner. The loser is the student left holding the card with the "Unhappy Face." Prior to playing the game, go over all the cards and their associations with the class. Discuss each card in light of what is wrong or right with it and why.

*How to Play** (Go over directions with students prior to play Deal out all the cards** to the players. Each player looks at his or her hand, locating all the pairs. These pairs are placed face up on the table in front of the player. The situations illustrated on each card are briefly described by the player discarding them, indicating the unsafe and corresponding safe behavior. If the match is correct, the pair remains on the table; otherwise, the cards are returned to the player's hand. After each player has cleared his or her hand of all pairs, the student to the left of the dealer starts the game by drawing a card from the hand of the student on his or her left, and so on, in turn, around the table. Each time a player draws a card, he or she clears his or her hand of any pairs, again briefly indicating the safe and unsafe behavior illustrated on the matched cards. Remember: it is best not to let it be known when the Unhappy Face has been passed from one hand to the next. A player drops out of the game once his or her hand is empty of all cards. The cards are numbered for ease in checking correctly matched pairs. A list of the correct pairs by numbers follows, along with a brief description of each card.

Board Game

Students exercise their understanding of the difference between safe and unsafe habits by playing a simple board game. Materials required include a small game board, a set of cards (both provided on the following pages), and a die. Class breaks into small groups of three or four students. If possible, make copies of the attached game board and cards and give each group a set of game materials. If it is not possible to make additional copies of the materials, the game can be played by the students in their free time. The first time the game is played, the students cut out and color their own safe (smile) - unsafe (frown) cards and paste the game board onto cardboard*** for durability. Each group will need a die to determine the number of boxes to move on the board. Instructions appear on the following game "board." Read the directions aloud to the class to ensure that students understand the rules. Depending on your students, you may also wish to discuss each picture on the game board prior to playing. A game key indicating which pictures depict safe and unsafe behavior has also been provided. Students should be allowed to check their safe and unsafe situations with those on the key at the end of the game or if a dispute arises.

---

*Played like "Old Maid."

**It may be wise to back the attached playing cards with cardboard for durability.

***Manila folders also work well as backings for the game boards. When students finish playing, the game and its pieces can be stored in the same folder.

Variations and Supplementary Activities:

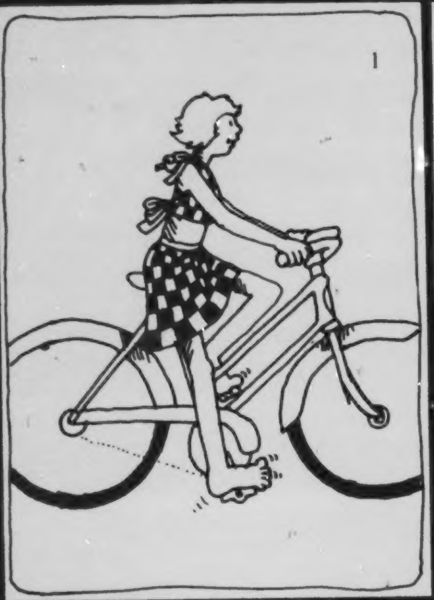
Students can write or tell a story based on one or more illustrations chosen from the game board.

Students can make their own safety card game and/or add to the cards already provided in this game.

Card Game

Game Key (correctly matched pairs)

1-16
2-17
3-18
4-19
5-20
6-21
7-22
8-23
9-24
10-25
11-26
12-27
13-28
14-29
15-30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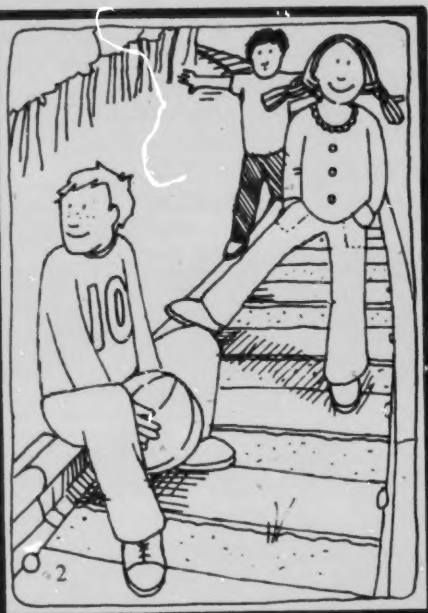

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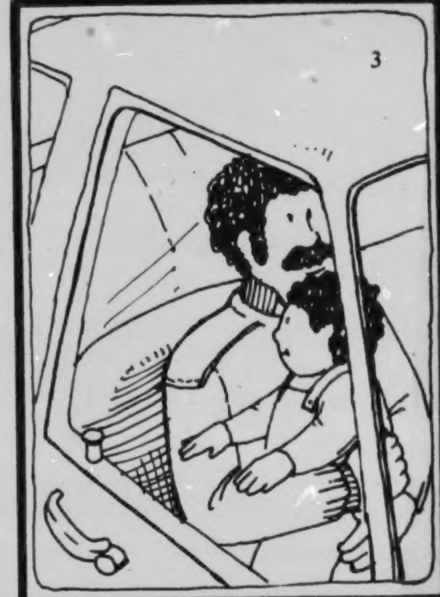
CUT ALONG
HEAVY LINES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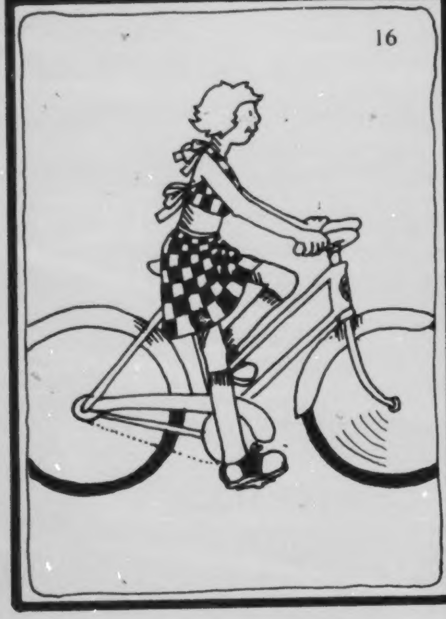
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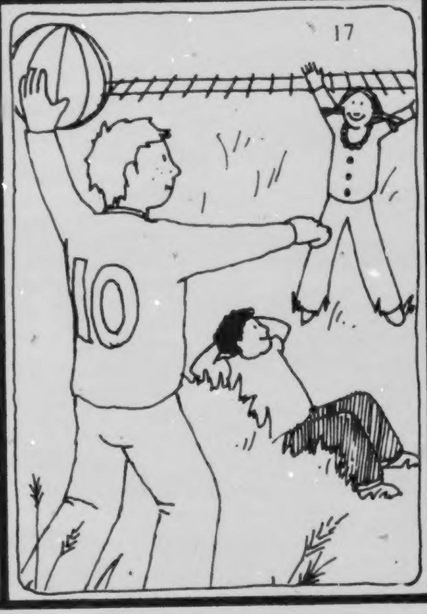

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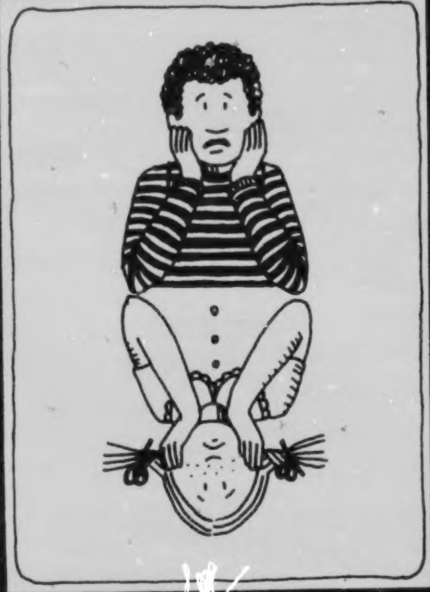

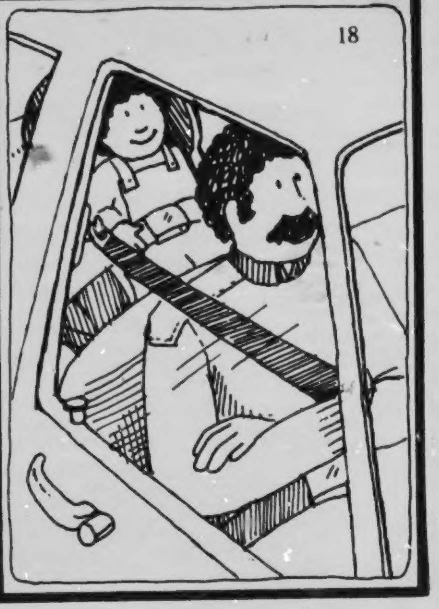
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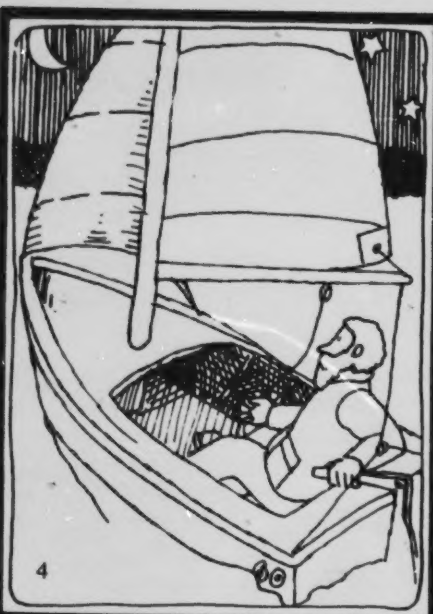
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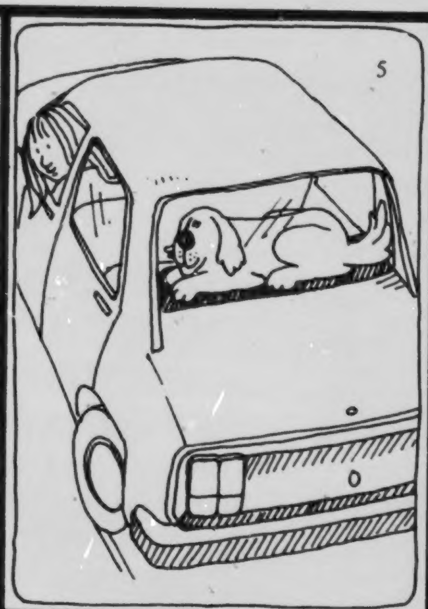
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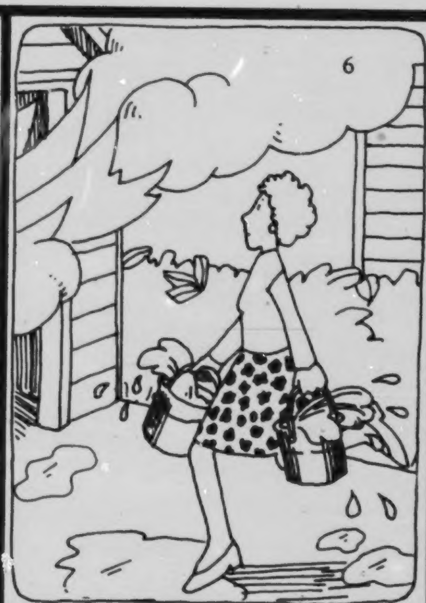
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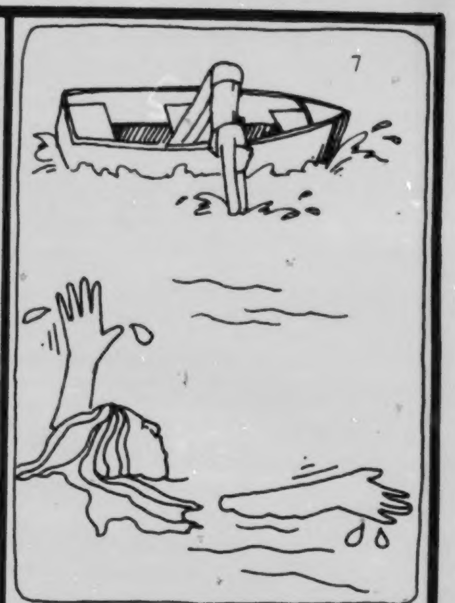
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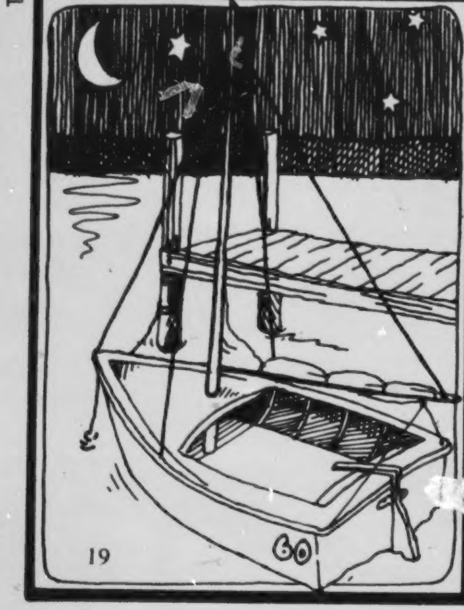
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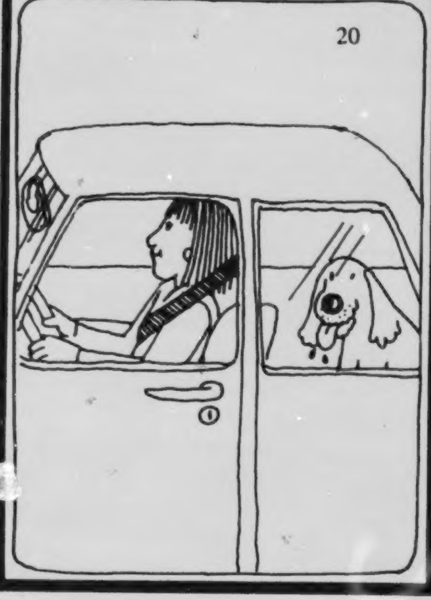
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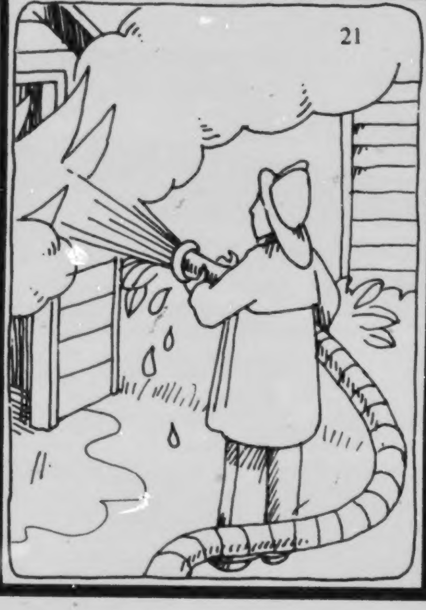
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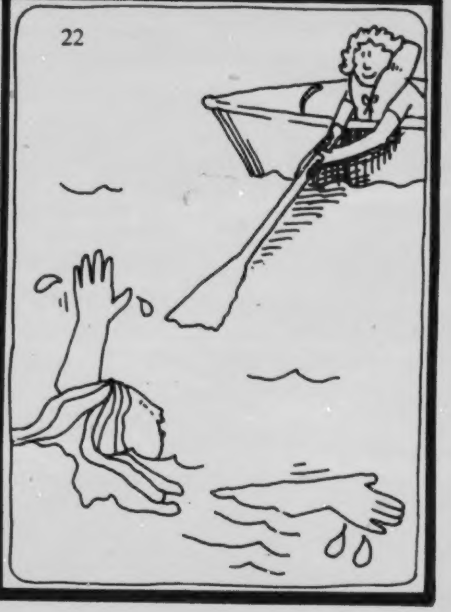
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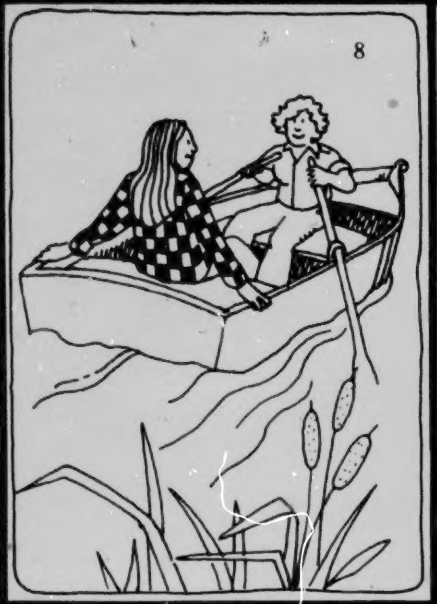
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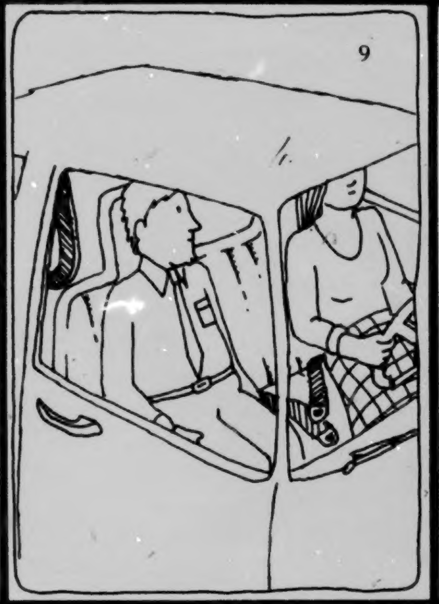
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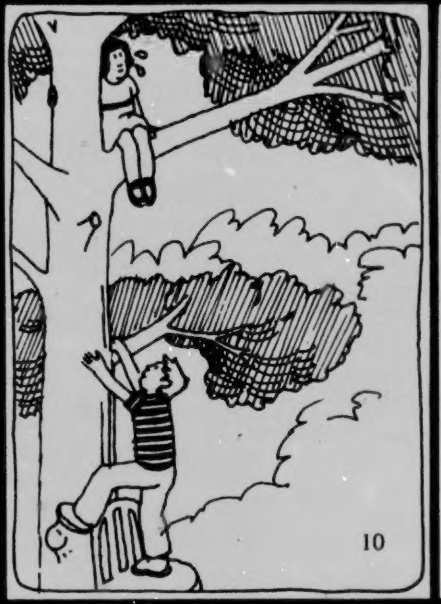
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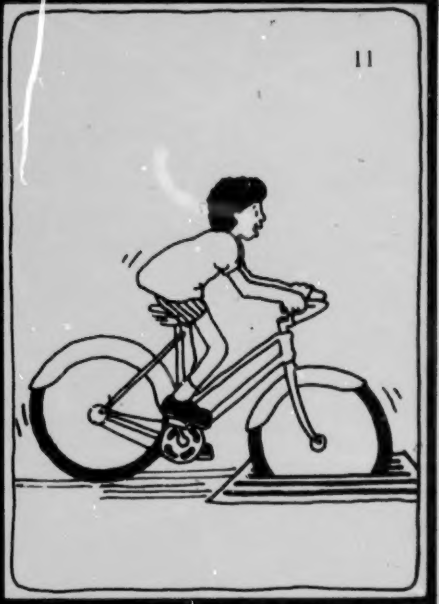
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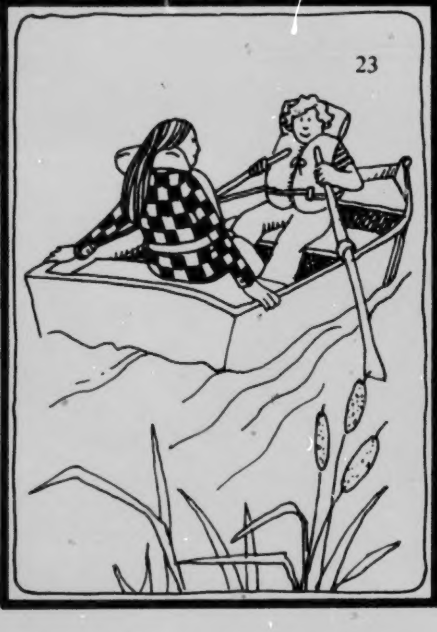
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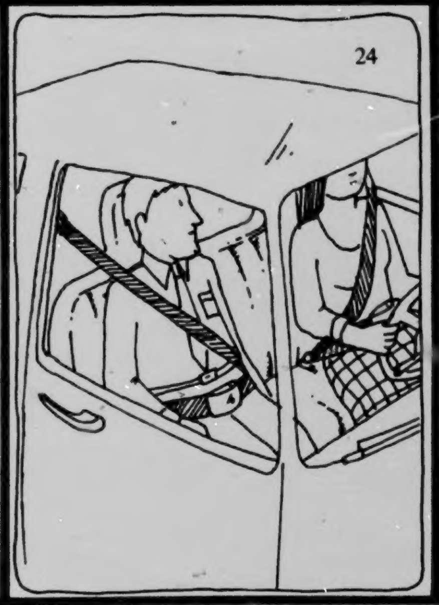
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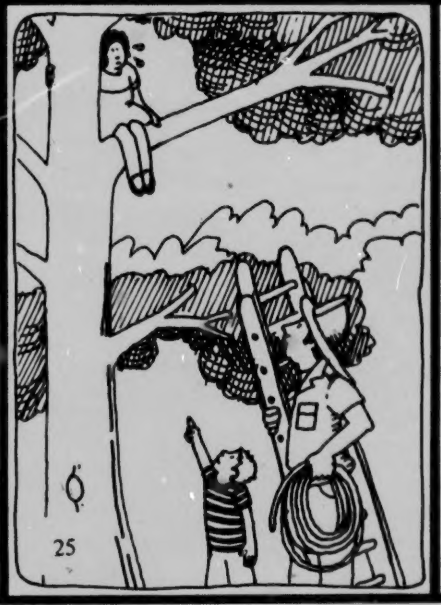
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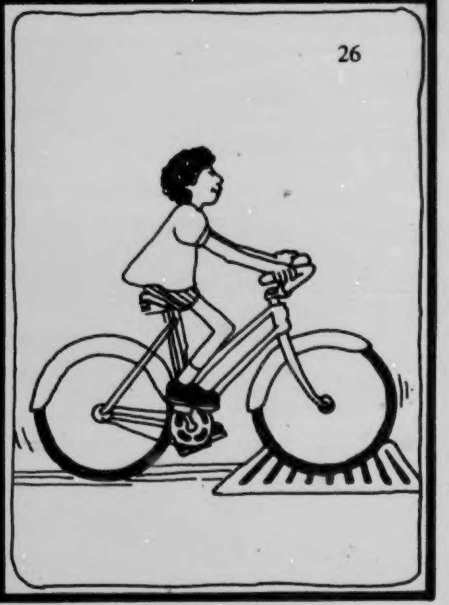
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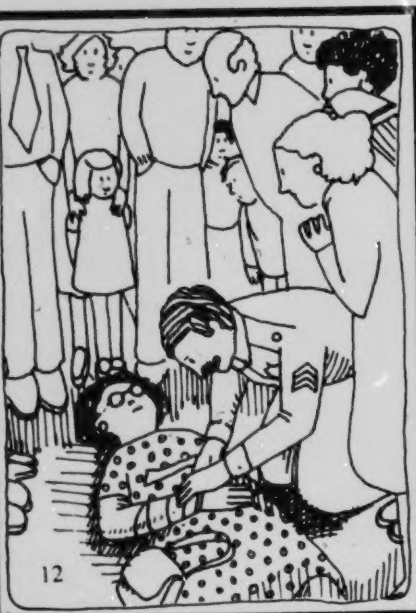
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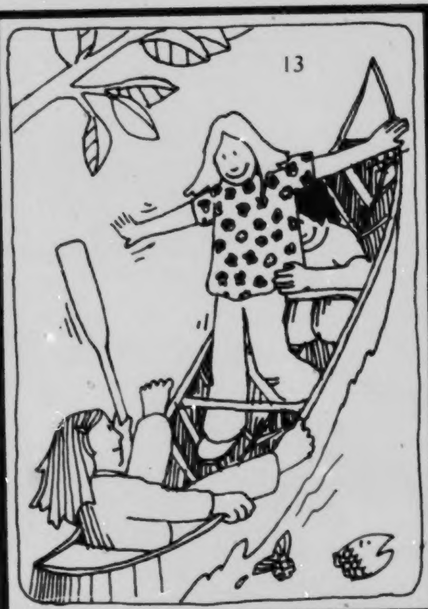
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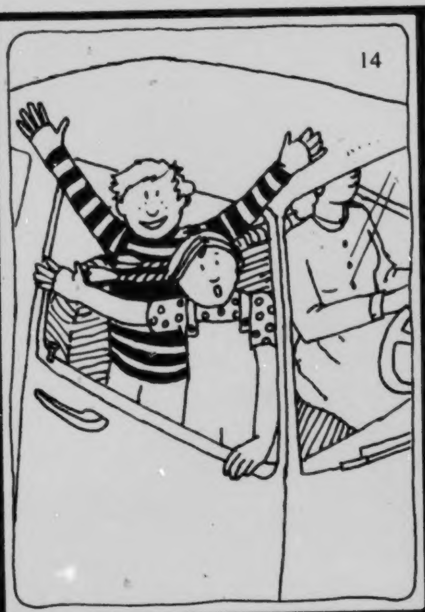
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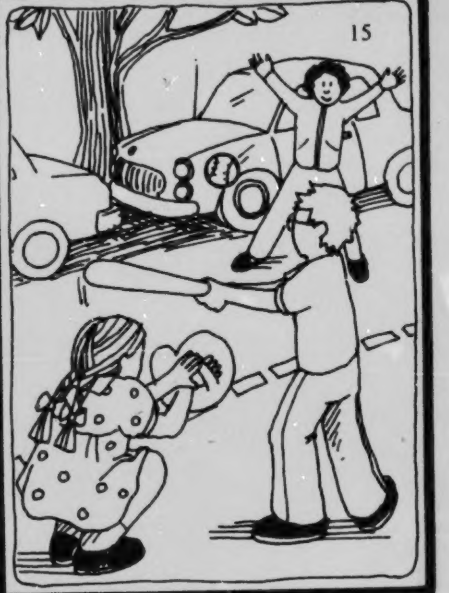
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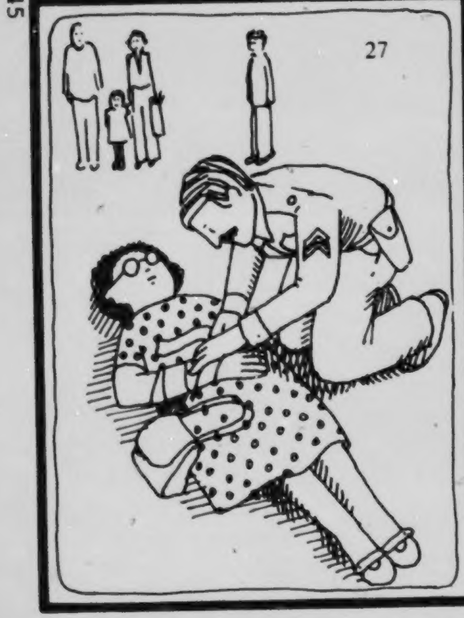
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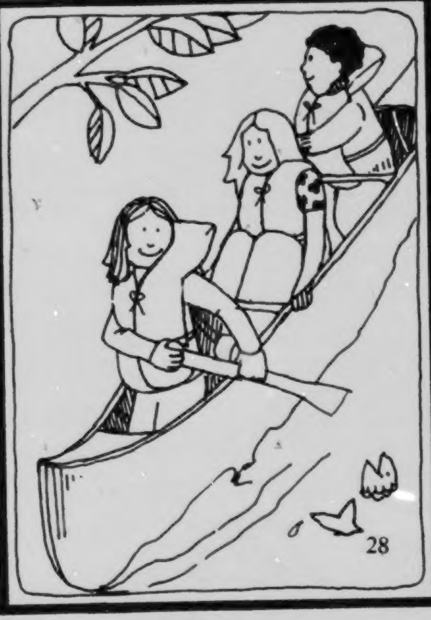
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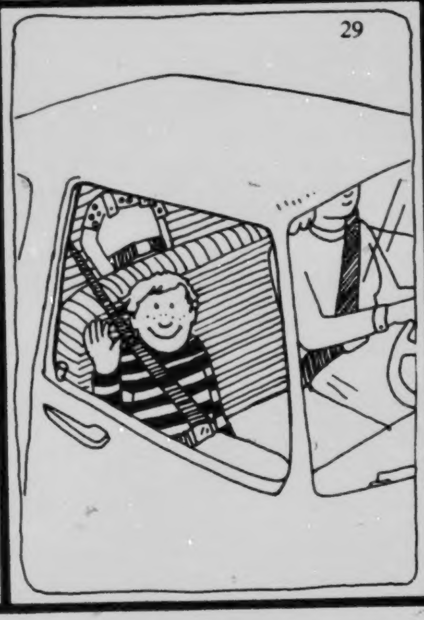
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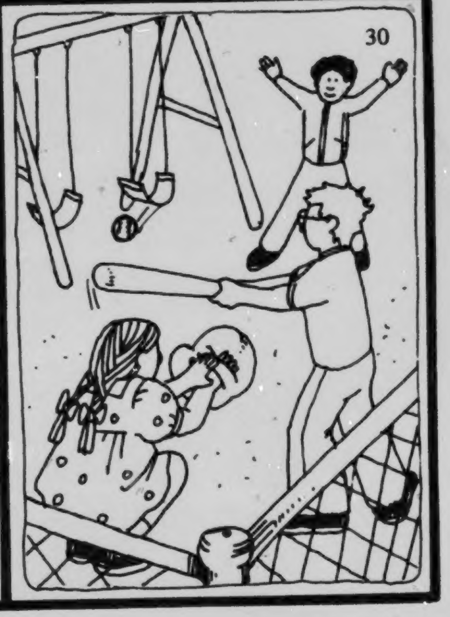
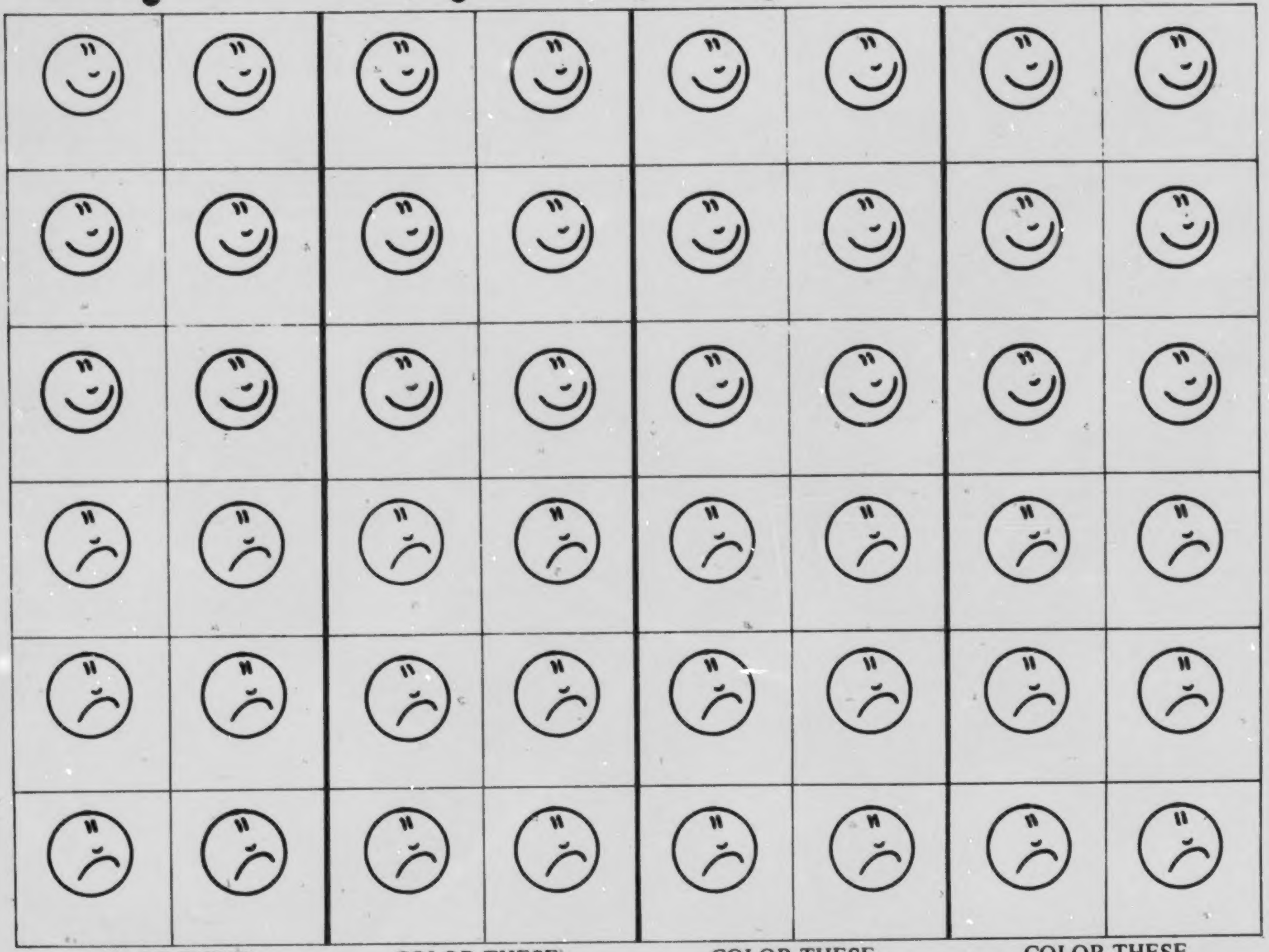

30

Board Game

Game Key (safe/unsafe boxes--game board boxes are numbered in the bottom right-hand corner)

1. safe
2. unsafe
3. unsafe
4. unsafe
5. safe
6. safe
7. unsafe
8. unsafe
9. safe
10. safe
11. unsafe
12. safe
13. safe
14. unsafe
15. unsafe
16. unsafe
17. unsafe
18. unsafe
19. safe
20. safe
21. safe
22. safe
23. safe
24. unsafe
25. safe
26. unsafe
27. safe
28. unsafe

Player 1 Player 2 Player 3 Player 4



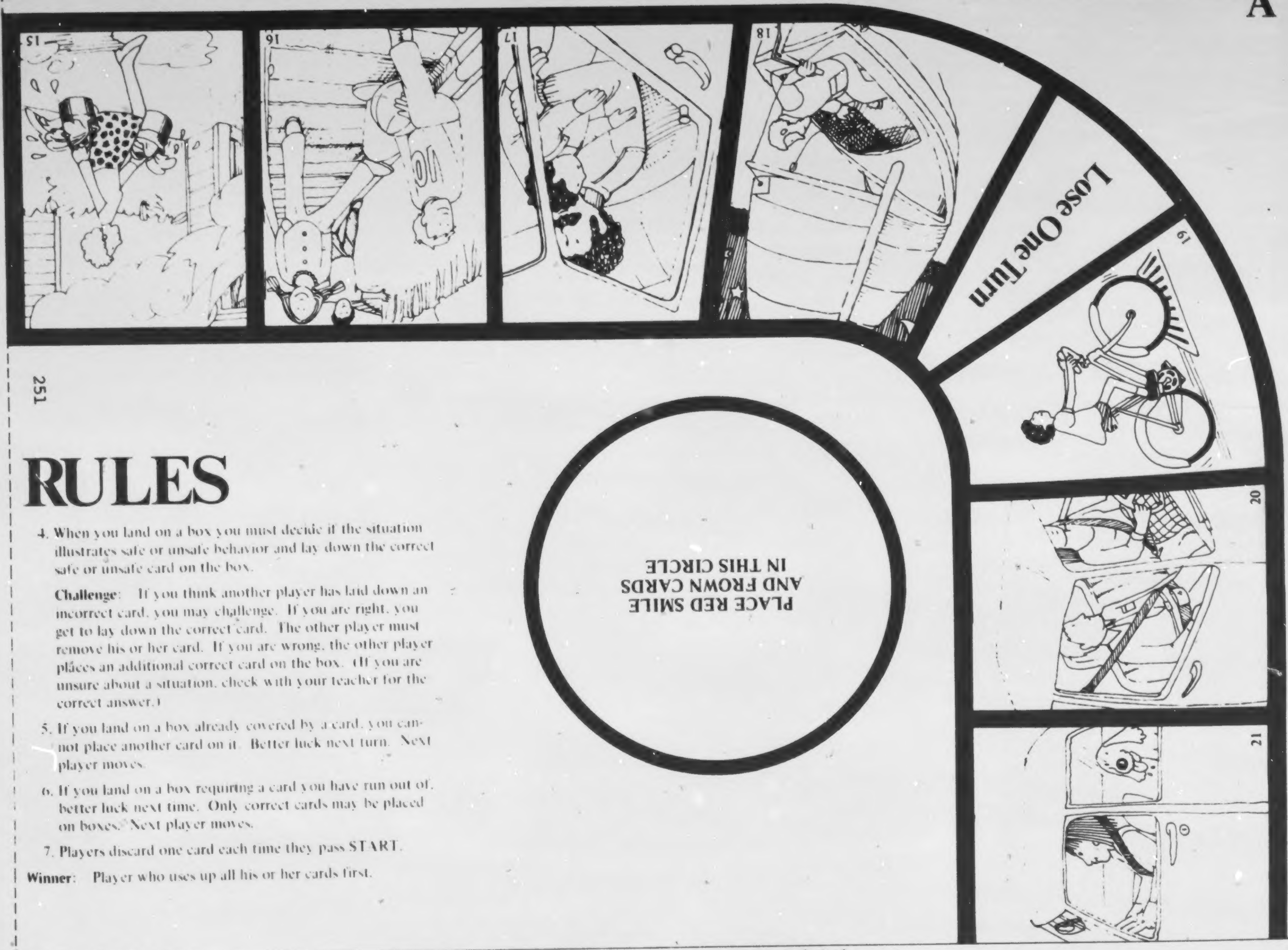
COLOR THESE
FACES RED

COLOR THESE
FACES YELLOW

COLOR THESE
FACES BLUE

COLOR THESE
FACES GREEN

Cut along dotted line



RULES

4. When you land on a box you must decide if the situation illustrates safe or unsafe behavior and lay down the correct safe or unsafe card on the box.

   Challenge: If you think another player has laid down an incorrect card, you may challenge. If you are right, you get to lay down the correct card. The other player must remove his or her card. If you are wrong, the other player places an additional correct card on the box. (If you are unsure about a situation, check with your teacher for the correct answer.)

5. If you land on a box already covered by a card, you cannot place another card on it. Better luck next turn. Next player moves.
6. If you land on a box requiring a card you have run out of, better luck next time. Only correct cards may be placed on boxes. Next player moves.
7. Players discard one card each time they pass START.

Winner: Player who uses up all his or her cards first.

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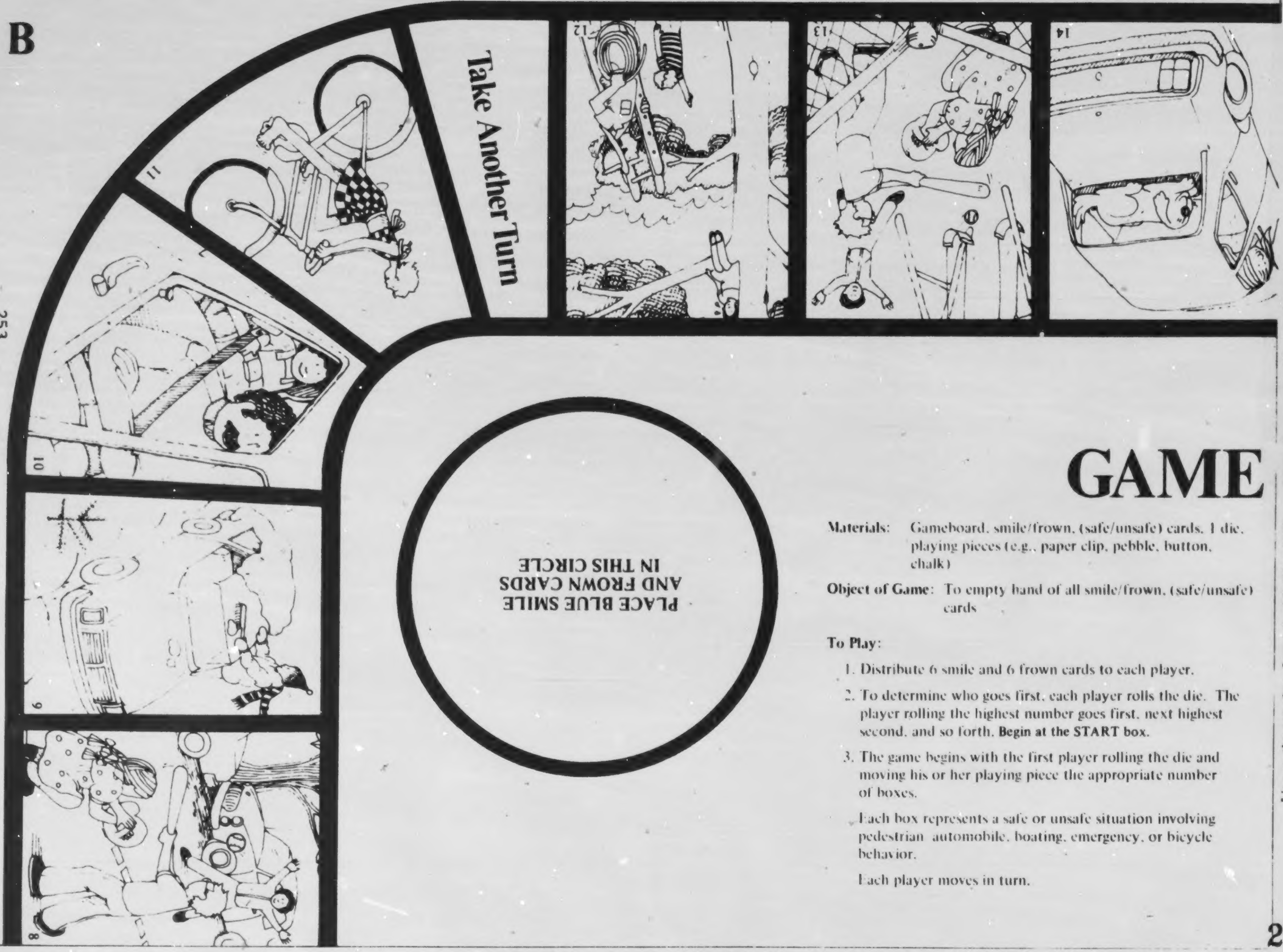
B



GAME

Materials: Gameboard, smile/frown, (safe/unsafe) cards, 1 die, playing pieces (e.g., paper clip, pebble, button, chalk)

Object of Game: To empty hand of all smile/frown, (safe/unsafe) cards

To Play:

1. Distribute 6 smile and 6 frown cards to each player.
2. To determine who goes first, each player rolls the die. The player rolling the highest number goes first, next highest second, and so forth. **Begin at the START box.**
3. The game begins with the first player rolling the die and moving his or her playing piece the appropriate number of boxes.

   Each box represents a safe or unsafe situation involving pedestrian automobile, boating, emergency, or bicycle behavior.

   Each player moves in turn.

← Match this arrow with the arrow on page C

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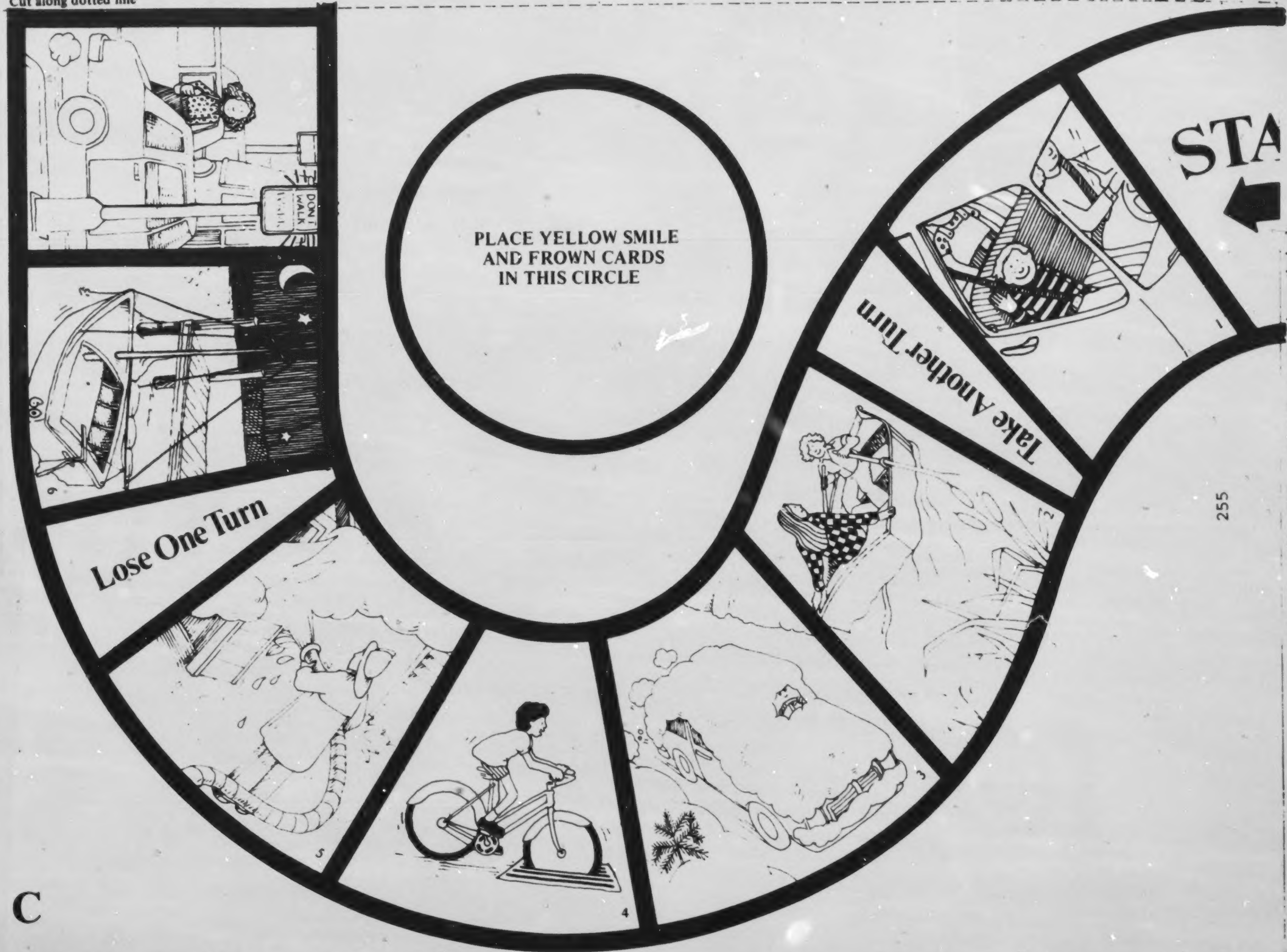
Line up the cut edge of page C with this solid line and tape the pages together on the back.

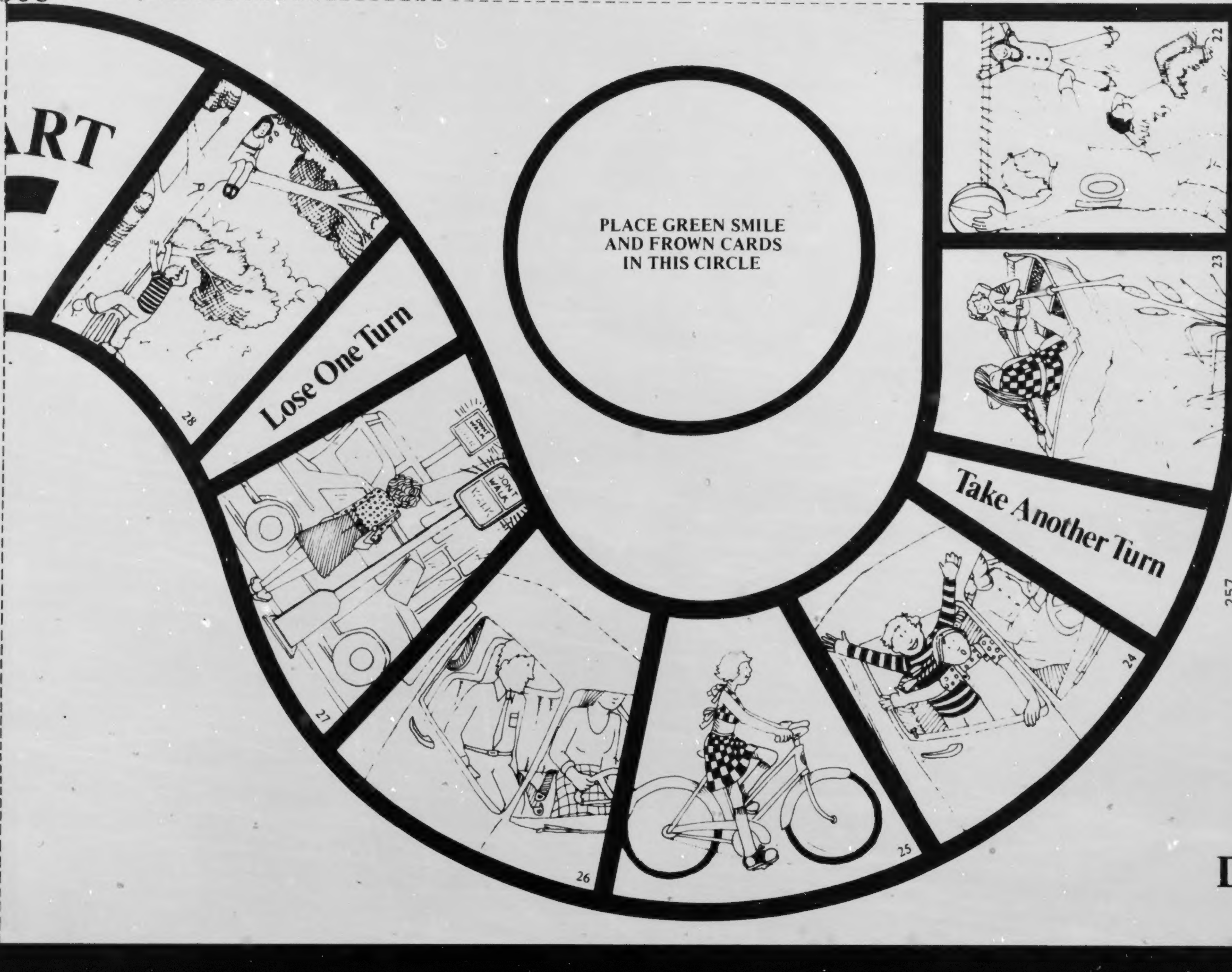
Cut along dotted line


STA
1
Take Another Turn
2
3
4
5
Lose One Turn
6
DON'T WALK
7
PLACE YELLOW SMILE
AND FROWN CARDS
IN THIS CIRCLE

Line up the cut edge of page D with this solid line and tape the pages together on the back.

C

Cut along dotted line


ART
Lose One Turn
28
27
DON'T WALK
WALK
26
25
24
Take Another Turn
23
22
PLACE GREEN SMILE
AND FROWN CARDS
IN THIS CIRCLE
D

Match this star with the star on page A ★

Cut along dotted line

SUPPLEMENTARY ACTIVITY

Activity #33, which follows, suggests quiz questions you can use after teaching one or more of the mini-units or individual activities.

ACTIVITY #33

Supplementary Activity　　　　Approximate Class Time: ½-1 period

Capsule Activity Description: Students answer questions on transportation safety.

Objective:
To evaluate what students have learned during their study of transportation safety.

ACTIVITY

A series of questions follows on transportation safety. You will want to choose only those questions which treat aspects of transportation safety which your students have studied.

These quiz questions can be used to evaluate a mini-unit or to supplement the evaluation methods included in the objectives statement at the beginning of each activity.

1. Put a circle around all the things that can make riding in a car dangerous.

   (a) Eating while driving
   (b) Passengers jumping around the car
   (c) Wearing safety belts
   (d) Packages piled up against the back window

2. Passengers who bother the driver can cause an accident. (Circle True or False)

   True False

3. Most American use safety belts most of the time. (Circle True or False)

   True False

4. Name three rules you would make for somebody your age about walking and playing safely.

   (a) ______________________________

   (b) ______________________________

   (c) ______________________________

5. Playing in the street is dangerous even when there are no cars in it. Why is that true?

6. You and your friends are going to play baseball in the big field behind the factory. You discover that the only flat place for your diamond is pretty close to the railroad tracks. You set up the diamond so that home and first base are next to the tracks. That way you get the diamond straight and it will be easy to tell when a ball is hit foul. What's wrong here? What should you and your friends do instead?

7. Name three things you should carry on a boat for safety.

(a) ______________________________

(b) ______________________________

(c) ______________________________

8. If someone falls off a boat into the water, what is the one thing you should *not* do to try to help him?

9. Name three kinds of emergency vehicles you have in your town or city.

(a) ______________________________

(b) ______________________________

(c) ______________________________

10. Name one thing that would make you call for the help of each of these emergency vehicles.

(a) Ambulance ______________________________

(b) Fire Engine ______________________________

(c) Police Car ______________________________

11. Every time you travel, you should think of your safety. (Circle True or False)

True False

Answers

1. a, b, d

2. True

3. False

4. -----

5. -----

6. -----

7. Personal flotation device
   Paddle
   Flashlight
   Fire extinguisher
   Horn or whistle
   Running lights
   Radio

8. Jump in the water to save him.

9. -----

10. (a) Someone is injured or very sick.
    (b) Fire, someone needs to be rescued.
    (c) Robbery, someone is hurt.

11. True

BIBLIOGRAPHY

BIBLIOGRAPHY

The bibliography contains educational materials for classroom use and for use by teachers in developing relevant units of study on transportation safety. It consists of selected

- Curriculum materials
- Background materials for teachers
- Materials for students
- Periodicals

The individual entries in the curriculum materials and student materials sections are presented in the following format:

**	*Title of Work,* date of publication. Number of pages or list of materials. Price.
Type of Material	Text description of material with evaluation of material's quality and relevance for transportation consumer education.
	Source from which material may be obtained.*

For purposes of convenience, the curriculum materials have been rated by the designation of stars next to the material description. (See sample above.) The stars represent the authors' evaluation based on the following scale:

No stars:	material is useful, but fair
(*) One star:	material is good
(**) Two stars:	material is very good
(***) Three stars:	material is excellent

It should be kept in mind that these evaluations are an estimation of the material's *quality and relevance.*** As such, the absence of a teaching material or a low rating does not *per se* indicate the material is poor. It may be excellent but simply not relevant to the Manual's content. In addition, any absences may be due to the authors' oversight.

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*Allow ten weeks for delivery of items ordered from the U.S. Government Printing Office.

**A complete discussion of the criteria used to evaluate the materials may be found on pages 468 & 469.

At the end of the Manual is a list of government agencies which can be contacted for further information about transportation safety.

Automobile Safety

*** *Safety Instructional System* (no date). 285 pages. $2.00.

Guide

Excellent guide that covers pedestrian, school bus, bicycle, auto passenger, and school environment pedestrian safety. Activities are plentiful, creative, and detailed. Bibliography is complete. Well illustrated. Guide does fail to discuss or include activities on affective safety issues such as peer pressure, rebellion, search for "kicks," and "it-won't-happen-to-me" thinking.

Maryland State Department of Education
Post Office Box 8717
Friendship International Airport
Baltimore, Maryland

* *Teaching Children About Safety Belts,* 1973. 32 pages. 40¢.

Guide

Manual of K-4 level activities designed to encourage students to use and to get their parents to use seat belts. Useful for elementary teachers. Has some creative activities. Provided with the booklet is a simple board game called SAFETY BELT GAME that is fun but may not motivate students to use seat belts.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

The New Look in Traffic Signs and Marking, 1972. 19 pages. 35¢.

Pamphlet

Sprightly, multi-colored pamphlet describing motor vehicle, pedestrian, bicyclist, etc. signs, signals, and pavement markings. Profusely illustrated.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 5001-0027

Traffic Safety Education Films (no date). 2 pages. Free.

Catalog

Annotated list of films on traffic safety, from freeway driving to alcohol-traffic safety.

Contact nearest American Automobile Association (AAA) office or

AAA Foundation for Traffic Safety
1712 G Street, N.W.
Washington, D.C. 20006

*** *Automobile Safety Belt Activities Book*, 1973. 13 pages. 25¢.

Guide Detailed suggestions for classroom activities on seat belt use, such as crossword puzzles, poems, short story writing, and surveys.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Pedestrian Safety

*** *Safety Instructional System* (no date). 285 pages. $2.00.

Guide Excellent guide that covers pedestrian, school bus, bicycle, auto passenger, and school environment pedestrian safety. Activities are plentiful, creative, and detailed. Bibliography is complete. Well illustrated. Guide does fail to discuss or include activities on affective safety issues such as peer pressure and "it-won't-happen-to-me" thinking.

Maryland State Department of Education
P.O. Box 8717
Friendship International Airport
Baltimore, Maryland

* *Traffic and Pedestrian Education Systems*, 1973. 37-page Leader's Guide, 23 spirit masters, fifteen cassette tapes, fifteen filmstrips. $86.00.

Module Comprehensive multimedia unit covering all aspects of pedestrian safety for youngsters, including crossing streets, selecting safe routes to school, care with railroad tracks, and the meaning of signs. Behavior in cars and bicycle riding are also covered. Unit consists of fifteen modules. For each module the following are provided: audio-tape geared to filmstrip; "immediate reinforcement activities" consisting of suggested activities such as songs and children's games; discussion topics; 1-2 activity masters--activities consist of coloring exercises; and supplemental reinforcement activities such as reading poems, making wall murals, creating trains out of cartons, role plays, and children's games. Activities are creative but not always detailed. Sheet music for nine songs is provided. Tapes have music, singing, and dialogue. General approach is injunctive and cognitive, but many activities present the opportunity for more open-ended and affectively oriented classroom experiences. Filmstrip and spirit masters use ethnic minorities but are very middle class.

Elisar Research Corporation
15 East 48th Street
New York, New York

Background Materials for Teachers

Automobile Safety

Amrine, Michael. *The Safe Driving Handbook.* (Grosset and Dunlap, New York: 1970).

Burby, John. *The Great American Motion Sickness.* Little, Brown and Company, Boston: 1971).

Fales, Edward P. *Belts On, Buttons Down; What Every Mother Should Know About Car Safety.* (Delaconte Press, New York: 1971).

Nader, Ralph. *Unsafe at Any Speed.* (Bantam Books, New York: 1972; revised 1973).

Emergency Vehicles

Keller, Hartmut. *An Analysis of Freeway Emergency Service Systems.* (National Technical Information Service: Springfield, Virginia, 1969; Catalogue #AD 695-378).

Boats and Recreational Vehicles

Andrews, Howard, L., and Dr. Alexander L. Russel. *Basic Boating: Piloting and Seamanship.* (Prentice Hall, Englewood Cliffs, New Jersey).

BUC International Corporation. *BUC's 1976 New Boat Directory.* (Ft. Lauderdale, Florida: 1976).

Malo, John, W. *Snowmobiling: The Guide.* (MacMillan, New York: 1972).

Malo, John. *All Terrain Adventure Vehicles.* (MacMillan; New York: 1972).

Thomas, James Lee. *Safe Snowmobiling: Fun Without Damage.* (Sterling Publishing Co., New York: 1971).

Tuite, James, J. *Snowmobiles and Snowmobiling.* (Tower, New York: 1971).

U.S. Department of Interior. *Offroad Recreational Vehicles.* (U.S. Government Printing Office, Washington, D.C.: 1972).

Wallace, Clark. *The Complete Snowmobile.* (Scribner, New York: 1971).

Wimer, Sally. *The Snowmobiler's Companion.* (Scribner, New York: 1973).

Materials for Students

Train Ride. John Steptoe. 26 pages.

Book

Fiction. Charles and his friends take a train to Times Square, then discover they have no train fare home.

Charlie and the Great Glass Elevator. Ronald Dahl. 1972.

Book

Fiction. Dahl relates the adventures Charlie encounters with the glass elevator. Easy reading.

Alfred A. Knopf, Inc.
New York

Jetport. Norman Richards. 96 pages. 1973.

Book

Jetport explains to young readers, in words and pictures, how an airport moves hundreds of airplanes and thousands of passengers safely and efficiently.

Doubleday and Co., Inc.
Garden City, New York

Jobs in Transportation. Genevieva Gray. 95 pages. 1973.

Book

A discussion of the many and varied jobs which are dependent on transportation and are responsible for the safe and efficient movement of goods and passengers.

Lothrop, Lee and Shepard Co.
105 Madison Avenue
New York, N.Y. 10016

The Story of Traffic Control. Ross R. Olney. 72 pages.

Book

A history and description of the many devices that control the flow of people and vehicles moving from one place to another (e.g., automobile regulations; control of pedestrian traffic, sea traffic, rail and air traffic). Also a look into the future of traffic control--automated highways, radar-controlled cars.

Prentice-Hall, Inc.
Englewood Cliffs
New Jersey

Minibikes. Gordon Jennings. 91 pages.

Guide A guide to buying, riding, and maintaining a minibike.

Prentice-Hall, Inc.
Englewood Cliffs
New Jersey

Periodicals

Periodicals can be a rich source of information on transportation safety. Even general consumer periodicals, like *Consumer Reports* and *Changing Times*, contain in many issues an article on transportation safety. Unfortunately, it was not feasible to include a definitive list of all relevant periodicals. For example, there are over two dozen on motorcycles alone. It was also impossible to provide here a list of relevant articles that have appeared in the recent past in periodicals. Moreover, the subscriber or reader cannot know in advance when a periodical will print an article that will interest him. Despite these drawbacks, many teachers and students will find it useful to subscribe to or read library copies of periodicals in the expectation that they will discover articles or references to additional materials of immediate relevance to their teaching or research efforts. The more specifically a periodical is related to his particular interest, of course, the more likely is the reader to find relevant materials. Teachers can also consult in libraries the *Reader's Guide to Periodical Literature* for past articles about transportation.

American Motorcycle Association News
5655 North High Street
Worthington, Ohio 43085

Changing Times
The Kiplinger Magazine
Editors Park, Maryland 20782

Coast Guard Boating Safety Newsletter
Department of Transportation
Office of Boating Safety
400 Seventh Street, S.W.
Washington, D.C. 20590

Consumer Educator
National Association of Secondary
School Principals
2101 Sixteenth Street, N.W.
Washington, D.C. 20036

Consumer News
Federal Office of Consumer Affairs
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Consumer Reports
Consumer's Union
256 Washington Street
Mt. Vernon, New York 10550

Mini-Bike Guide
P.O. Box 1380
Huntington Beach, California

Motor Trend Magazine
8490 Sunset Blvd.
Los Angeles, California 90069

Newsletter of the American Council on Consumer Interests
238 Stanley Hall
University of Missouri
Columbia, Missouri 65201

Of Consuming Interest
Federal State Reports
P.O. Box 986
Arlington, Virginia 22216

Road and Track Magazine
P.O. Box 2324
FDR Post Office
New York, New York 10022

Skylights
National Aerospace Education Council
Suite 310
806 Fifteenth Street, N.W.
Washington, D.C. 20005

Sno Goer
1999 Shepard Road
St. Paul, Minnesota 55116

Traffic Safety
The National Safety Council
425 North Michigan Avenue
Chicago, Illincis 60611

Transpo Topics for Consumers
Department of Transportation
Office of the Secretary
Washington, D.C. 20590

PUBLIC TRANSPORTATION

WHY TEACH ABOUT PUBLIC TRANSPORTATION

The Problems

American consumers are the purchasers and users of nearly 124 billion dollars per year worth of personal transportation goods and services.

The mobility and convenience of the automobile have created an enormous imbalance in our transportation modes and a neglect of public transportation. Patronage of public transportation services (buses, trolleys, subways, and trains) declined from 23 billion in 1946 to 6.95 billion in 1975, a decrease of 67 percent.

The number of motor vehicles increased from 31 billion in 1945 to 133.7 million in 1975, an increase of over 300 percent. Of the 133.7 million vehicles in 1975, 107.3 million were passenger cars.

A shift in emphasis from automobiles to public transportation is essential to provide a means of transportation for the one in five families living in cities and one in four families living in small towns who do not own a car; the people who do own cars but who are on countless occasions unable to use them due to personal incapacitation, loss of license, loan of the car, car repairs; and the elderly and the permanently disabled who cannot drive.

The use of public transportation will help eliminate massive traffic congestion. At this time, 77 percent of the nation's workforce commutes to work every day by private automobile; 70 percent of these people drive alone. Thirty-two urban areas account for 37 percent of all motor vehicles, contributing to heavy traffic congestion.

Public transportation will help reduce auto-related accident fatalities. More people have been killed on our nation's highways than the total number of Americans killed in wars fought by this country. Public transportation will also reduce the energy consumption of motor vehicles by 25 percent. Eighteen percent of the nation's energy is consumed by motor vehicle transportation. Nearly 80 percent of this amount is for personal travel by car, truck, or bus. While Americans reduced their vehicle fuel consumption in 1974 and 1975 as a result of the immediate fuel crisis, early 1976 patterns indicate an increase in vehicle fuel consumption.

The Solutions

Federal and state governments must promote balanced transportation by providing assistance for planning, development, and financing of improved transportation systems; and enact legislation which would be of assistance to the public transportation area.

Local transit authorities could generate greater use of their services by making public transportation more accessible and attractive to the daily traveler; and find solutions to their severe financial problems.

Citizens/consumers should become informed of local transportation problems and participate in their remedies and take advantage of available public transportation services.

Teachers must guide students to a better understanding of the causes and effects of transportation problems, and of possible solutions. Transportation consumer education can offer students a unique opportunity to develop awareness and skills essential to acquire responsible transportation habits and to play a role in supporting and improving transportation in the community.

This chapter focuses on teaching public transportation by developing consumer skills that are particularly appropriate to students in Grades 4-6. The learning activities are designed to

- Stimulate students' awareness and understanding of public transportation
- Teach students to use public transportation
- Promote the safe and responsible use of public transportation
- Teach students to make choices among various modes of transportation
- Teach students to read route maps
- Teach students to assess residents' use of public transportation in their own community
- Introduce students to concepts of funding public transportation; planning public transportation systems; and involving citizens in transportation planning

PUBLIC TRANSPORTATION

Mini-unit 9

Ways people make decisions about traveling in your community

Activity #	*Activity Description*	*Class Time*[a] *(periods)*
34	The class discusses and defines public transportation.	½-1
35	Students assess their travel needs and their use of and ability to use public transportation.	2½-4
36	Students interview parents, neighbors, and/or relatives to determine the use of different modes of transportation.	2-3
	Mini-unit 10 Learning to use public transportation	
37	Students take a ride on a public transportation vehicle.	2-3
38	Students play a game in which they arrange community trips using the most appropriate mode of transportation.	1+
39	Students become familiar with local public transportation by working with route maps.	1½-2
40	Students compile a community "Places to Go-Things to Do" booklet.	1-2
	Mini-unit 11 Using public transportation safely	
41	Students describe emergencies they have experienced involving personal safety and relate those emergencies to travel emergencies on public transportation vehicles.	1
42	Students identify possible emergency situations on public transportation vehicles.	1-2
43	Students perform skits demonstrating the procedures for proper and safe behavior while using public transportation.	1-2

[a] Assumes class period of 30-40 minutes.

PUBLIC TRANSPORTATION (CONTD.)

Mini-unit 12

Designing an effective public transportation system

Activity #	*Activity Description*	*Class Time*[a] *(periods)*
44	Students plan a public transportation system for their community.	1
45	Students design their own public transportation systems.	3-4
46	Students develop advertising campaigns for public transportation.	1½-3

Supplementary Activities

Activity #	*Activity Description*	*Class Time*[a] *(periods)*
47	Students role play scenarios involving operators of public transportation.	1
48	Students answer questions on public transportation.	½-1

BIBLIOGRAPHY

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[a] Assumes class period of 30-40 minutes.

MINI-UNITS
AND
LEARNING ACTIVITIES

MINI-UNIT 9

WAYS PEOPLE MAKE DECISIONS ABOUT TRAVELING IN YOUR COMMUNITY

This mini-unit serves as an introduction to public transportation and works toward introducing and developing important transportation decision-making skills. It encourages students to recognize the extent to which they use transportation in their daily lives; to become aware of public transportation as a means of travel; to learn how other people travel in their community and why they use the particular means of transportation that they do.

The concept of public transportation may be difficult for young students to graps. Therefore it is advisable to work toward an understanding of public transportation *throughout* the mini-unit, gradually refining your definition of public transportation as your students gain a clearer picture of what it is.

This mini-unit can be integrated into a study of the community and ways people travel, or included as part of a larger unit on transportation. At the same time that the mini-unit is developing social studies skills, it will also reinforce several language arts skills, including list making, discussion, interviewing, evaluation, and analysis.

MINI-UNIT 9 LESSON PLAN

Ways people make decisions about traveling in your community

Activity #	*Activities*	*Class Time*
34	DESCRIPTION: The class discusses and defines public transportation. OBJECTIVE: To demonstrate awareness of the field of public transportation, students will be able to recognize and name at least five modes of public transportation and one reason why each might be used in a particular situation.	½-1 period
35	DESCRIPTION: Students assess their travel needs and their use of and ability to use public transportation. OBJECTIVE: After keeping their travel logs, students will be able to name at least three different ways they travel and give two reasons why they need each of these different ways to get around.	2½-4 periods
36 Spirit Master #8	DESCRIPTION: Students interview parents, neighbors, and relatives to determine the use of different modes of transportation. OBJECTIVE: By the end of the activity, students will be able to demonstrate an understanding of the need for and use of different modes of transportation by pointing out one advantage and one disadvantage of three different vehicles or modes.	2-3 periods

Total Class Time: 5-8 periods.

ACTIVITY #34

Mini-unit Topic: Ways People Make Decisions About Traveling in Your Community

Approximate Class Time: ½-1 period

Capsule Activity Description: The class discusses and defines public transportation.

Objective:
To demonstrate awareness of the field of public transportation, students will be able to recognize and name at least five modes of public transportation and one reason why each might be used in a particular situation.

Concepts Treated:

- There are many ways by which people can travel.
- Each community offers its citizens a number of ways to get around.
- Certain factors must be evaluated before deciding how one is going to travel.
- There are appropriate and safe methods for using public transportation.

Materials Needed:
Optional--illustrations of transportation modes.

ACTIVITY

Begin this unit and activity by first asking your students to define transportation and then, if they can, public transportation. For your information and as a basis for directing your students' discussion, a definition of public transportation follows:

> Public transportation refers to all modes of travel which operate within a community (as opposed to modes operating between cities and towns) and which involve vehicles which are publicly owned (e.g., by the government) or owned by private business (e.g., a taxi company) (as opposed to vehicles which are owned by private citizens, including automobiles, bicycles, and recreational vehicles). Public

transportation also includes the facilities (e.g., bus stop shelters and ferry docks) which serve public transportation vehicles and passengers.

Depending on the ability level of your students, your class definitions of public transportation may include more kinds of vehicles (e.g., planes, ships, helicopters) than are normally considered to be modes of public transportation. This may not be possible to avoid at this point in the unit. However, throughout the unit continue to work toward a better and clearer understanding of public transportation.

To help your students to better understand public transportation, you can gear your discussion to the following outline, adding to or deleting from the outline where necessary and appropriate. You may also want to enhance the discussion with illustrations of transportation vehicles. Illustrations of several modes of public transportation are attached. You may also wish to refer to the glossary which appears at the end of this chapter to aid you in this discussion.

What are the public transportation modes available in America and in your community? Do they include bus, train, subway, taxi, ferry, and light rail (trolleys)?

How can we learn what services are available?

Why aren't all modes of public transportation available in every community? How can and should people decide when to use public transportation and which modes of public transportation to use? To what extent does the decision depend on knowledge of public transportation; availability of public transportation; convenience, speed, cost, safety, and comfort; familiarity with the operations of public transportation; feelings about public transportation and automobiles, such as inappropriate fears of getting lost and attachment to using a fast or glamorous automobile; and concerns about the social, environmental, and energy-depleting effects of excessive reliance on automobiles?

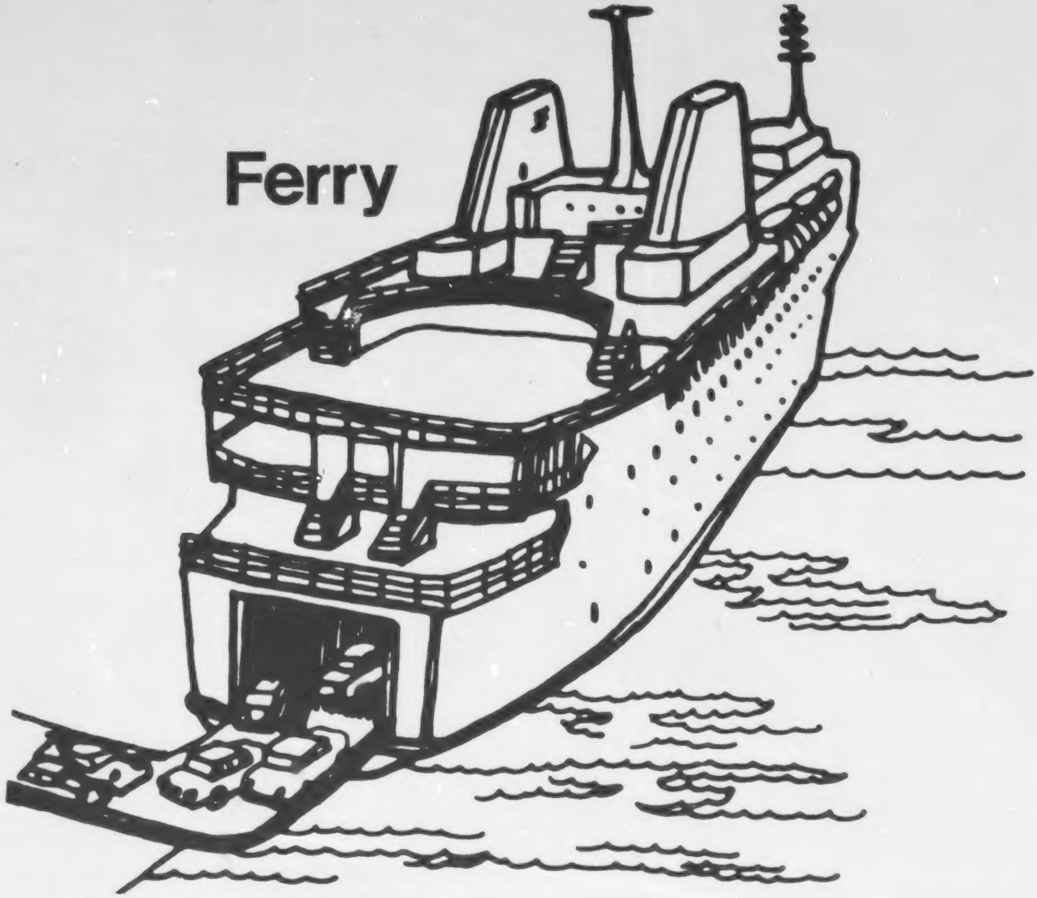
How does one go about using public transportation?

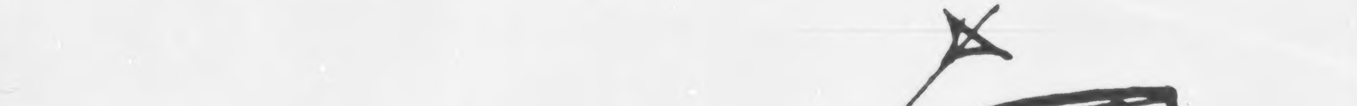
1. Why is it helpful to know how to use public transportation?

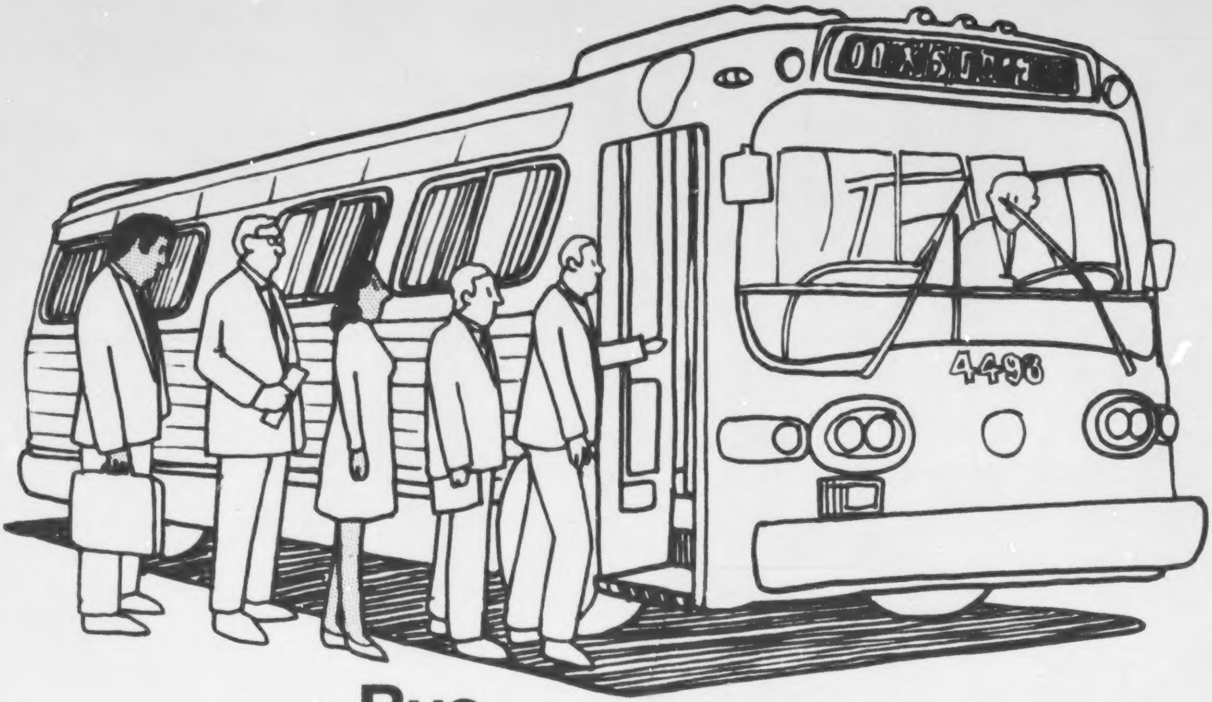
2. How can someone find out how to use public transportation?

3. Does vandalism on public transportation hurt people who normally use public transportation? What about the people who don't use public transportation, does vandalism of public transportation facilities hurt them at all?

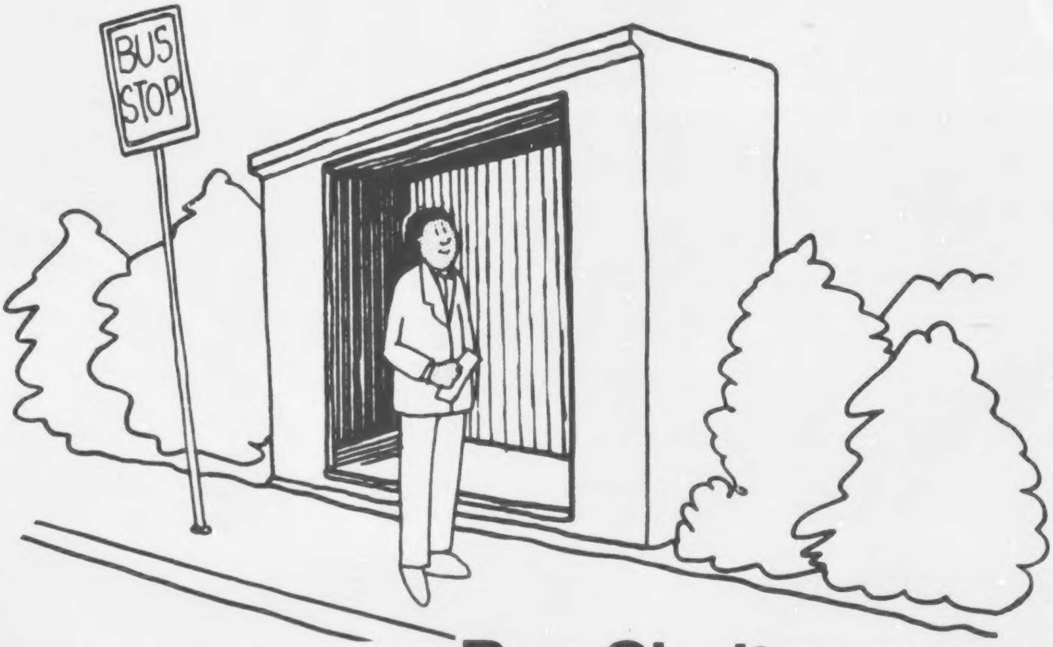
4. If people knew the consequences of vandalism do you think vandalism would still take place?


Ferry


Hydrofoil

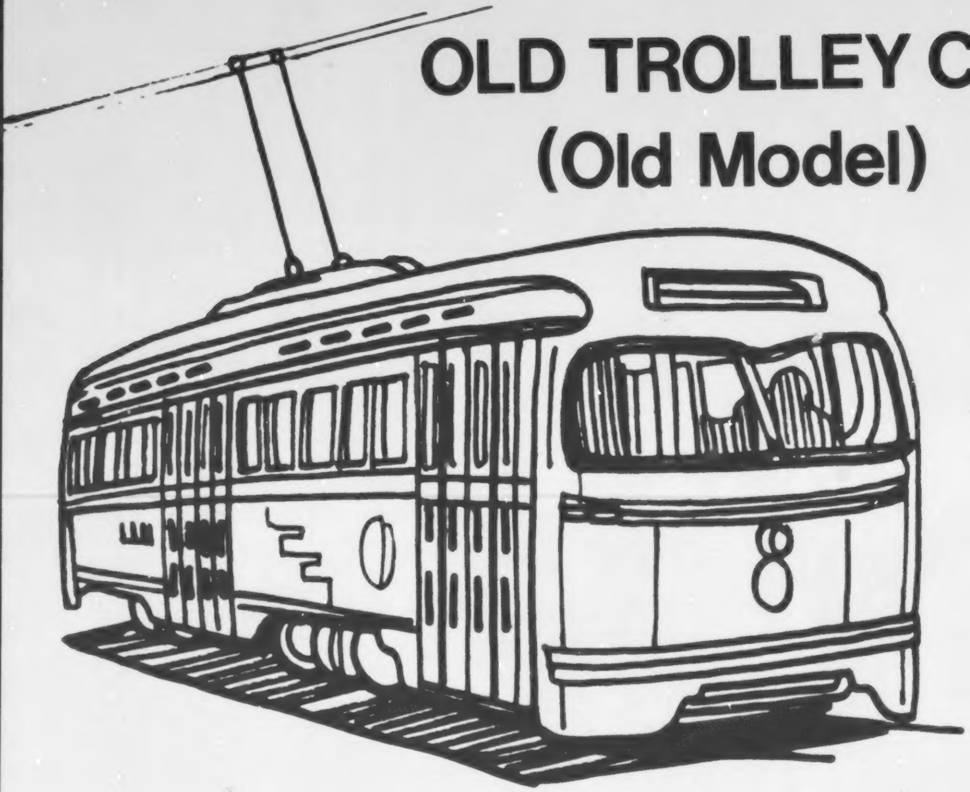


Bus

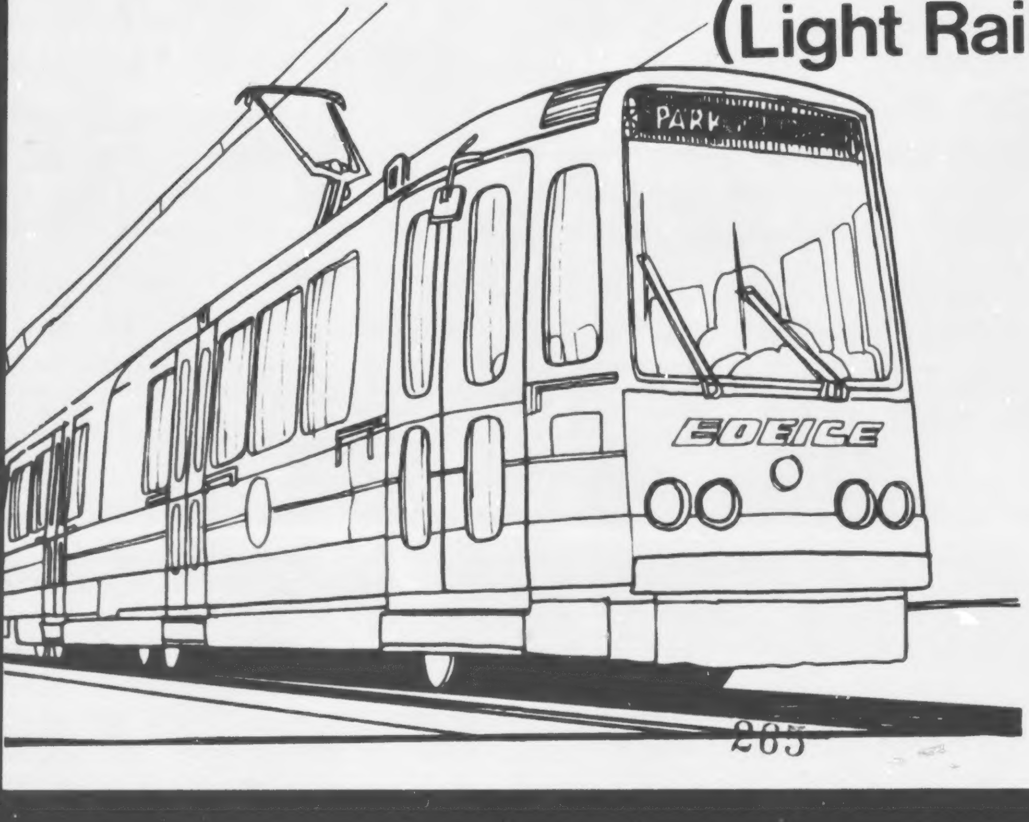


Bus Shelter

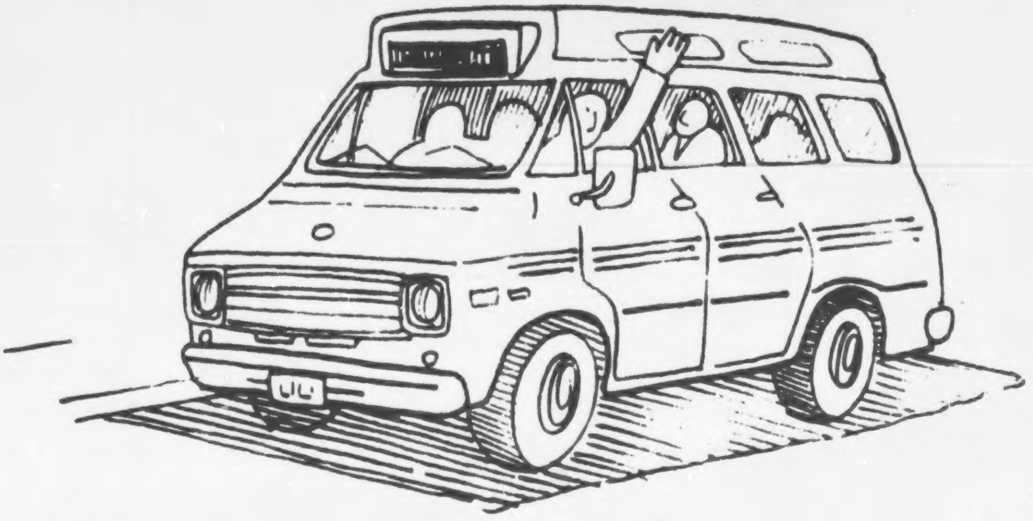
OLD TROLLEY CAR
(Old Model)

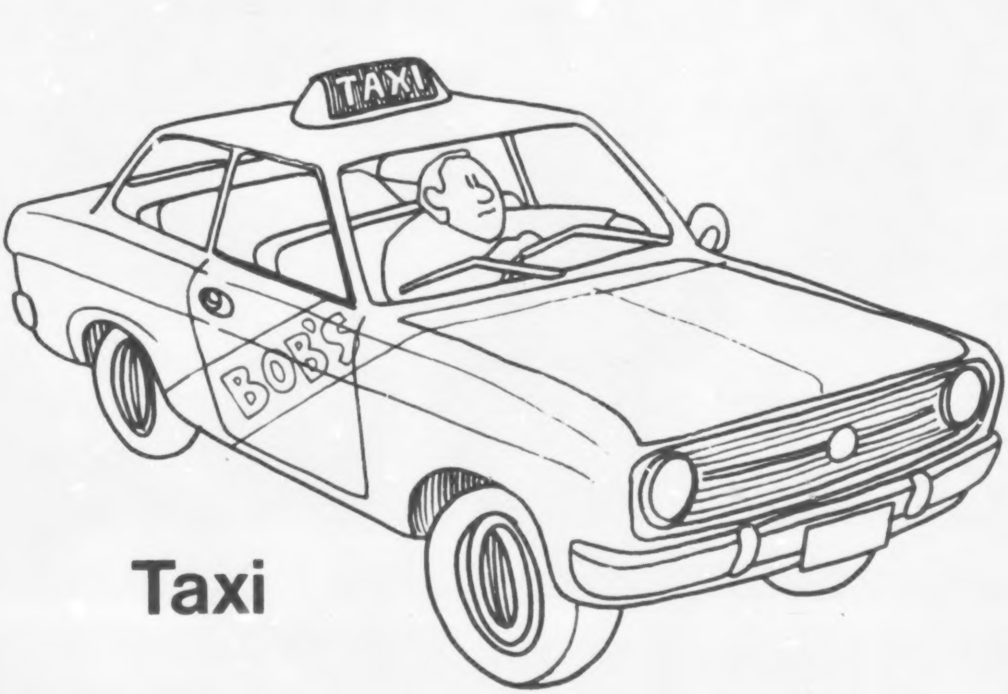


NEW TROLLEY CAR
(Light Rail Car)



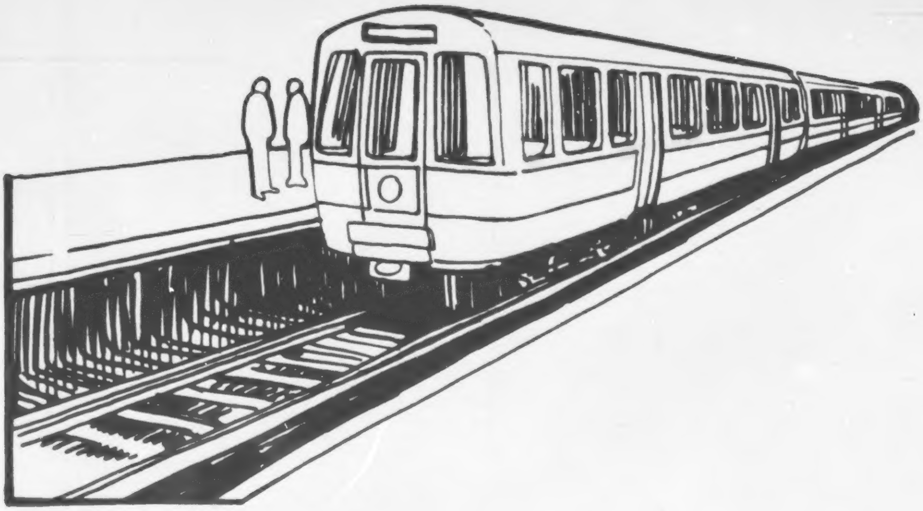
SHUTTLE VAN
(Demand Responsive Vehicle)



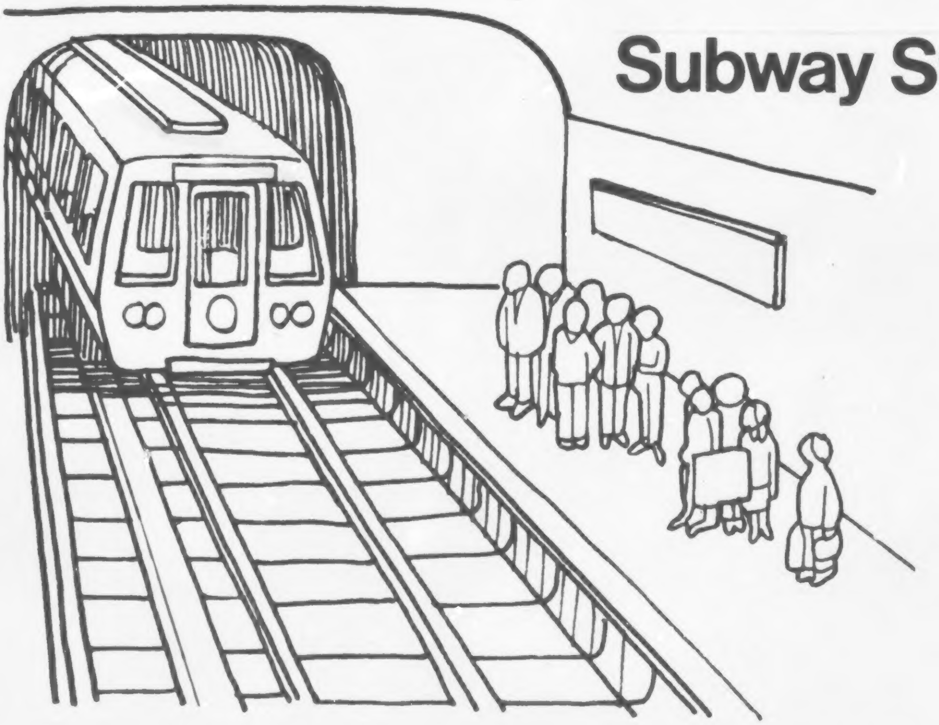


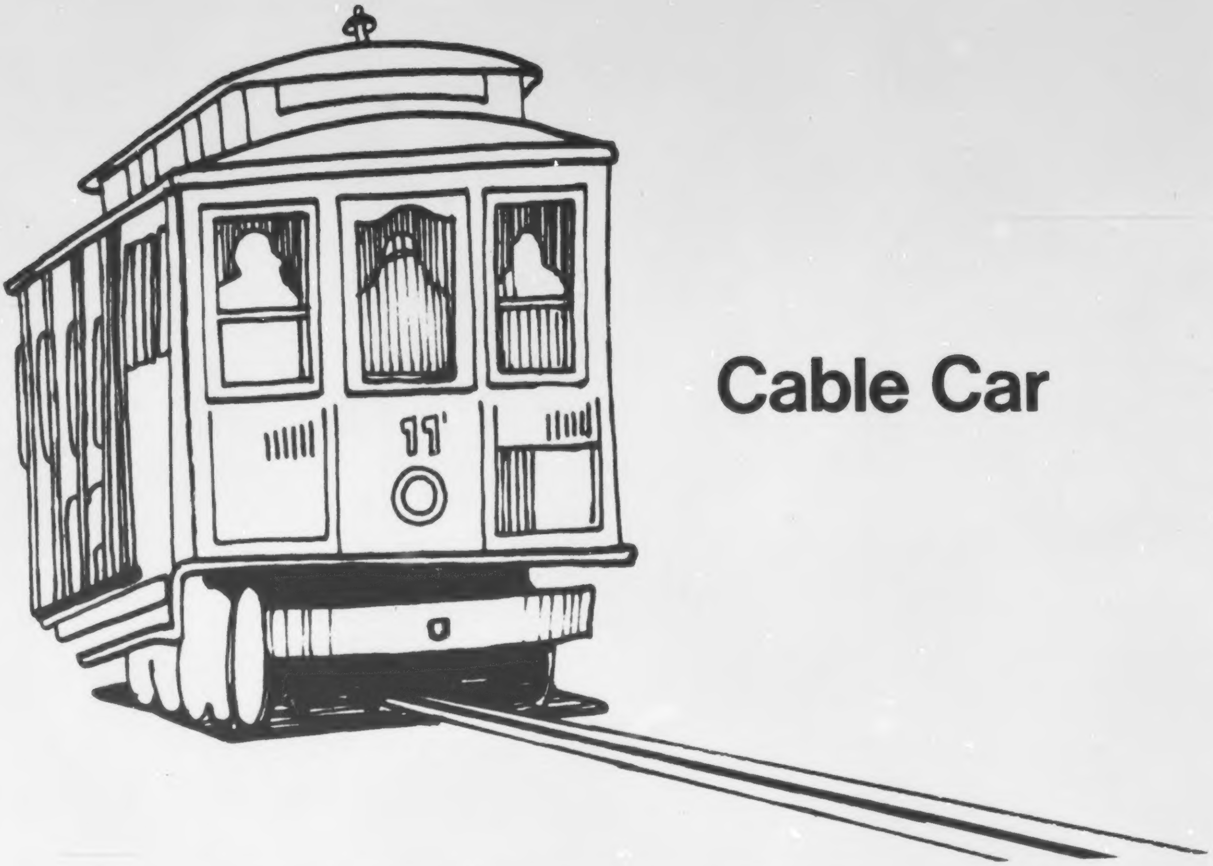
Taxi

Subway Car

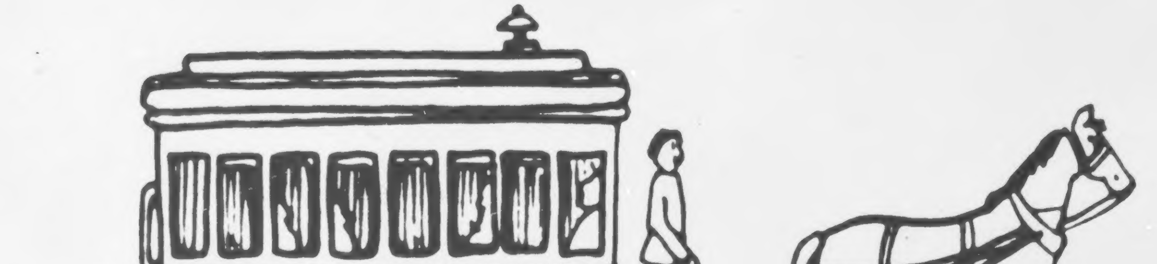


Subway Station

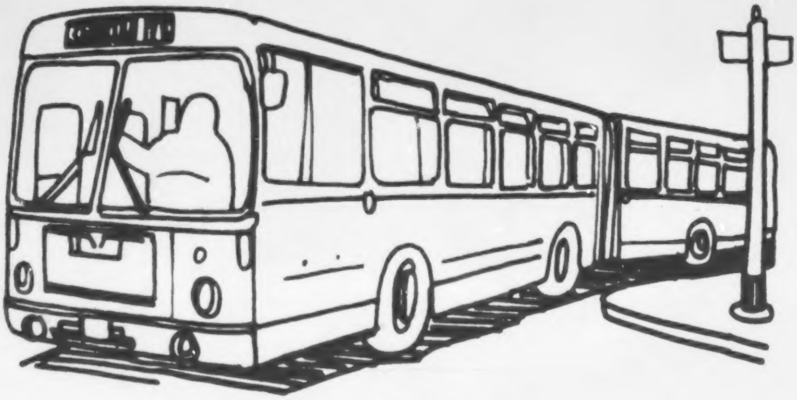




Cable Car

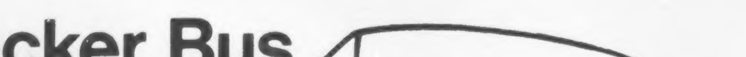


Horse Drawn Tram



A NEW BUS
(Articulated Bus)

Double Decker Bus



ACTIVITY #35

Mini-unit Topic: Ways People Make Decisions About Traveling in Your Community

Approximate Class Time: 2½-4 periods

Capsule Activity Description: Students assess their travel needs and their use of and ability to use public transportation.

Objective:

After keeping their travel logs, students will be able to name at least three different ways they travel and give two reasons why they need each of these different ways to get around.

Concepts Treated:

- We are all dependent on transportation.
- There are often alternatives to the ways people choose to travel.
- To make wise choices about transportation, one can use a logical decision-making process to select a travel mode.

ACTIVITY

For a period of several days, students, as a class, in small groups, or alone, keep a log of all the "traveling" they do by motorized and nonmotorized modes of transportation--bus, bicycle, walking, and so forth. An excerpt from a sample log follows.

Tuesday
  Rode bus to school
  Took bus home
  Rode bike to Billy's house
  Billy's mother drove us to the pool and home again
  Rode bike to my house
  Took bus to the library
  Walked home

Wednesday
  Took bus to school
  Went on field trip to local dairy by bus
  Took bus home from school

Mother drove me to trumpet lessons
Walked home
Walked to the drug store and home again

Thursday
Mother drove me to school this morning (missed bus)
Mother picked me up at school--had to go to the dentist
Picked Dad up at the train station and went home

At the end of the week, students tabulate their total number of trips by each transportation mode used. A running total is kept on the chalkboard or on a wall chart.

Discuss some or all of the following issues with the class.

- How would your life be different if there were no way to travel--even short distances?
- If all automobiles suddenly disappeared, how would people get around?
- If your parents' car were stolen or in the repair shop for a long time, how would that affect your ability to get around?
- If you aren't using public transportation (e.g., bus, subway, trolley, etc.) now, could you easily use it if you wanted to? Why or why not?
- If there is no public transportation in your area, should there be?

Using their logs, students determine if they would be able to travel by only one mode of transportation to the places they usually go. It should be noted that often we use various modes of transportation because one is more appropriate to our needs at that time or more accessible. The decision of whether or not to use public transportation is one that each person must make every day and in light of various factors.

When this exercise is completed, discuss the availability and accessibility of local public transportation and what can or should be done to improve it, if necessary.

Variation or Supplementary Activity:

Students can make up recommendations for the local public transportation systems and send their suggestions to local authorities for comment.

ACTIVITY #36

Mini-unit Topic: Ways People Make Decisions About Traveling in Your Community

Approximate Class Time: 2-3 periods

Capsule Activity Description: Students interview parents, neighbors, and/or relatives to determine the use of different modes of transportation.

Objective:

By the end of the activity, students will be able to demonstrate an understanding of the need for and use of different modes of transportation by pointing out one advantage and one disadvantage of three different vehicles or modes.

Concepts Treated:

- Most communities have several modes of public transportation available to them.
- Many people use a variety of transportation modes on a regular basis.
- Different people have different transportation needs.
- There are advantages and disadvantages to all modes of transportation.

Materials Needed:

Interview questionnaires, a retrieval chart.

ACTIVITY

Students interview a parent, neighbor, or relative to discover what mode of transportation they use most frequently and why. Most students will know how their parents travel in and around the community but they may not be aware of how others travel or why people use the modes they do. For this purpose, students either design an interview questionnaire of their own or use the one found on Spirit Master #8. To ensure an understanding of the interview process, students interview each other prior to taking their questionnaire into the field. You might also wish to have volunteers act out the sample interview, "How to Conduct a Poll," which may be found at the end of this activity.

Once students have completed their out-of-class interviews, results are tabulated on a retrieval chart (see next page). Students can either fill in the chart themselves as the interviews are completed or the class can do it together when everyone has finished the assignment. Discuss the results with the class, noting available community public transportation; use of public transportation in the community; apparent community public transportation needs; and the need for citizens to become involved in decisions involving public transportation.

In light of these results discuss the possible

- Need for citizens to become involved in decisions involving public transportation
- Actions citizens can take to improve public transportation services such as persuading friends and family to use them more often or more appropriately, participating in transportation planning, and engaging in political action such as voting and petitioning politicians
- Actions citizens can take to meet the grievances operators of public transportation have against citizens, such as vandalism and discourtesy

To illustrate the use of the various modes of transportation within the community, students make a transportation bulletin board or mural. Pictures are drawn of the people interviewed who drive cars, walk, or ride bicycles. The automobiles and drivers are cut out of paper and placed on a paper highway on the bulletin board. People who walk or ride bicycles are placed on a smaller road or sidewalk. Those people who ride buses, trains, trolleys, etc., are drawn sitting inside these vehicles or waiting outside the vehicles to board. In this way, students can graphically compare a sampling of people in their community who use public transportation.

Finally, discuss the apparent advantages and disadvantages of each transportation mode in terms of

- Pollution effects
- Traffic congestion
- Convenience
- Fare

RETRIEVAL CHART

Modes of Transportation[a]	*Bicycle*	*Bus*	*Car*	*Ferry*	*Subway*	*Light Rail (Trolley)*	*Train*	*Taxi*	*Walk*
How people travel									
Why they travel this way									
Mode of travel people would rather use									
"The Way to Go" (answers to Question 4 from questionnaire)									

---

[a] Available community transportation and any alternatives are filled in along the top of the chart.

How to Conduct a Poll

Sound of doorbell being rung

Door opens.

Female voice: Oh, hi, Judy? How are you?

Judy: Fine, Mrs. King. I'm . . .

Mrs. King: Carol isn't here, Judy. She's out somewhere, doing something or other for school. You probably know better than I what it is.

Judy: She's probably doing the same thing I am, going around . . .

Mrs. King: Oh, what's that?

Judy: Going around and asking the neighbors some questions about public transportation.

Mrs. King: Public transportation? Why? What is this all about?

Judy: We're studying public transportation. It's part of a course on consumer education. We are learning to be better consumers of transportation--to understand it better, to know what it costs, how to use different kinds of transportation safely--that kind of thing.

Mrs. King: Well, sounds interesting. A little far out for me, of course. I never use public transportation when I can help it. I seem to spend half of my life in my car.

Judy: Well, we are studying about all kinds of transportation, including cars, walking, bicycles, buses, and so on. Can I ask you a few questions?

Mrs. King: Sure, if it really is only a few. I do have some work to do. Do you want to come in?

Judy: No, thanks. There are just four questions, so it'll be real fast and it will probably go even faster if I just stand here. First . . .

Mrs. King: O.K., go ahead then.

Judy: First, how do you most frequently travel in the community? Do you do it by using a car, the bus, or by walking?

Mrs. King: Oh, you can stop, it's by using the car, clearly.

Judy: Well, let me just read the other choices: car--bus--walking--ferry--train--bicycle--taxi--subway--trolley--or something else--or perhaps you don't travel at all?

Mrs. King: Oh, no. I travel all right. As I said, most of my travel is by car. I walk a little, but not much, really just for the exercise, not to get anyplace. When I don't have my own car, I probably take a taxi.

Judy: That's fine. Can you tell me why you use the car? Is it because it is easy to use--economical--fast--fun--there is no other way to travel--or is there some other reason?

Mrs. King: Well, it probably is because it is so easy. There is the car in the garage, always ready to go. As long as I haven't forgotten to put gas in it. And the other reason is, there just isn't any other way to get around here. I mean, what could I do? There just is no bus around here, even if I wanted to use it. And subways, trains? I mean, they may have those in New York and Chicago, but we don't have anything like that. Are there any more questions?

Judy: Just two. If you could, would you rather use some other mode of transportation than the car?

Mrs. King: Well, I get a little tired of always driving around, and chauffeuring everybody everyplace, it seems. I wouldn't mind if I had less of that to do. But what are my options? There just isn't anything else that I can think of that would help me get everything done. No, I think the car is the best means for me, even if it sometimes becomes a pain.

Judy: Just one more question. This one is a little fanciful. If there were just one mode of transportation that everybody, I mean everybody, had to use and no other, what should that be? What kind of transportation would you pick for the one and only kind?

Mrs. King: That's sort of a desert island type of question. If I were in charge of transportation and I could have just one kind of transportation for everybody, what would I pick? Gee--I don't know. Certainly not cars--we just couldn't have a car for everybody. And walking wouldn't get anybody anyplace. I mean, everybody would have to work where they lived.

I don't know that I can answer that. The closest all-purpose transportation is probably the bus. I mean my husband could take a bus to work and there are inter-city buses, and big buses and little buses, and they are relatively cheap.

But still. . . I mean if we had no cars and had to depend on buses only . . . How would I get my shopping done?

Mrs. King: Judy, that last question worries me. I think I'll have to say I don't know. Or maybe better, I'll say one kind just isn't enough. There have got to be two or three kinds of transportation. At least.

Judy: Thank you, Mrs. King. Bye now.

Mrs. King: Bye, Judy. Transportation consumer education . . . wow . . .

Door closes.

MINI-UNIT 10

LEARNING TO USE PUBLIC TRANSPORTATION

This mini-unit focuses students' attention on public transportation in their own community. Many students are unaware of the various forms of public transportation, where they are located, what areas of the community they serve, how much they cost, and how to select a mode of transportation for their needs. All these factors are considered and treated in this mini-unit.

Once students have gained an understanding of how public transportation can be used to meet their needs, they can then move on to learn how to use it safely and appropriately under both normal and emergency conditions. Mini-unit 11, which follows this unit, attempts to promote this kind of behavior.

The concepts developed in this unit include

- One should learn how to use public transportation and know what to expect when doing so.
- There are methods for selecting the most appropriate means of transportation to accommodate each person's needs.
- There is a need for more than one mode of transportation.
- Public transportation route maps are an important travel aid.
- Some community public transportation systems are more efficient than others.

It should be noted that the activities in this unit are especially appropriate for students living in communities served by several modes of transportation, or at least a well developed bus system. Without public transportation nearby, the activities would have to proceed hypothetically and may not be as effective and worthwhile.

MINI-UNIT 10 LESSON PLAN

Learning to use public transportation

Activity #	*Activiites*	*Class Time*
37	DESCRIPTION: Students take a ride on a public transportation vehicle. OBJECTIVE: By the end of the activity students will be able to list the steps involved in using a given public transportation vehicle.	2-3 periods
38	DESCRIPTION: Students play a game in which they arrange community trips using the most appropriate mode of transportation. OBJECTIVE: Students will demonstrate knowledge of the decision-making process necessary for choosing a mode of travel by listing (in writing or orally) four things to consider before making a selection.	1 period +
39 Spirit Master #9	DESCRIPTION: Students become familiar with local public transportation by working with route maps. OBJECITVE: At the end of the activity students will demonstrate their map reading skills by plotting a route between two points given the starting place and destination and an appropriate public transportation system map.	1½-2 periods
40	DESCRIPTION: Students compile a community "Places to Go-Things to Do" booklet. OBJECTIVE: Given a known point of interest in the community, students will write or orally relate the way or ways to get there from home or school and the route(s) to follow.	1-2 periods

Total Class
Time: 5½-8
periods.

ACTIVITY #37

Mini-unit Topic: Learning to Use Public Transportation

Approximate Class Time: 2-3 periods

Capsule Activity Description: Students take a ride on a public transportation vehicle.

Objective:

By the end of the activity students will be able to list the steps involved in using a given public transportation vehicle.

Concept Treated:

- One should learn how to use public transportation and know what to expect when doing so.

ACTIVITY

Arrange for a field trip to a local transportation facility (e.g., subway station, trolley barn) or arrange for a vehicle to be brought to the school (many public transportation systems are more than willing to bring a bus to school for demonstration purposes). Request that, if at all possible, students be allowed to ride in a vehicle as if they were actually using that mode of transportation (e.g., putting money in fare box, watching for their stop). This enables students to learn how to use public transportation in a controlled setting, without the fear which usually accompanies an initial experience.

Prior to the trip, discuss with the class what they will see and should look for while on their tour of the facility or riding in the vehicle. (If there are no public transportation facilities in your community, provide the students with the information necessary to use public transportation, then have the class simulate the process of using a mode of public transportation.)

If your focus is on buses, some of the things you might want to discuss follow.

- What kind of people work in a bus company? What do they do there?

- If you wanted to go by bus to ________________(name of the next town or city), what are some of the things you would have to find out about in order to get where you want to go?

- If someone told you that you needed "correct change" to take the bus, what does he mean?

- If you weren't sure at which stop you were to get off the bus, what would you do?

- How should a person act when he or she uses public transportation? Why? Who gets hurt when someone damages a bus? Who pays to fix that damage?

When you return from your field trip, make a list of all the things the students noticed while riding in the vehicle or touring the facility (e.g., ticket counter, turnstyle, maps, signs, newspaper stand.). As a class discuss the function of each of these things and how they benefit the passenger.

Next, students determine the steps and draw up a set of travel guidelines for successfully taking a trip on a bus or other public transportation vehicle. Once the class has outlined the steps needed to be followed, ask several students to simulate the process. The class comments on the role play and revises its travel guidelines accordingly.

Variations and Supplementary Activities:

Prior to the field trip, you can hold a contest to name one or more vehicles at the facility you will be visiting. Check with the authorities at the facility for permission for your students to christen a vehicle by giving it a name or, in some way, decorating it. There might also be the possibility of holding a contest in your school or community, in cooperation with the local bus, taxi, subway, or commuter train company, to permanently name a fleet of their vehicles--Brenda Bus, Speedy Subway, Truckin' Train, Tooting Trolley.

Students can compile a *Travel Guidelines Booklet* to aid public transportation users.

ACTIVITY #38

Mini-unit Topic: Learning to Use Public Transportation

Approximate Class Time: 1 period +

Capsule Activity Description: Students play a game in which they arrange community trips using the most appropriate modes of transportation.*

Objective:

Students will demonstrate knowledge of the decision-making process necessary for choosing a mode of travel by listing (in writing or orally) four things to consider before making a selection.

Concepts Treated:

- There are methods for selecting the most appropriate means of transportation to accommodate each person's needs.
- There is a need for more than one mode of transportation.
- There are advantages and disadvantages to the various modes of transportation.

Materials Needed:

Game cards (attached).

ACTIVITY

The decision of whether or not to use public transportation is one that each citizen must make every day. It is never possible to decide once and for all to use only public transportation or to use only the

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**Transportation Game*. c Abt Associates Inc., 1972 (excerpted here by permission). Complete classroom kit available at $24.00 plus $1.50 shipping and handling from: Games Central, 55 Wheeler Street, Cambridge, Massachusetts 02138.

automobile. That decision will always depend on particular factors and must be made daily in light of those factors. The following activity illustrates this decision-making process.

Overview. Students, acting as travelers, are given "place cards" which give information about a trip: the points of departure and destination, purpose of the trip, time constraints, and the funds available for the journey. Travelers* plan the trips according to the above factors by consulting with representatives of various transportation industries--busline, light rail (trolley), taxi company, and automobile drivers' club. From these representatives, the travelers get information concerning fare and time schedules** with which they make their choices and determine the most appropriate way for them to travel.

Included in the game is a set of transportation schedules. These have the individual costs already calculated and need only be coordinated with the time constraints outlined on the place cards.

How to Play. Prior to play, select four students or ask for volunteers to be transportation representatives for the first game (students switch off for the second game). If a large number of students are playing, 20 or more, it might be wise to have eight transportation representatives at one time--two for each transportation mode.

Arrange the representatives in distinct sections of the room. Representatives make the signs for their company (e.g., Drab Cab Company, Good Time Trolley, What-A-Bus Company, Hitch-A-Ride Drivers' Club) and are given their respective schedules. If two students are acting as transportation representatives, each takes half the schedules. The rest of the class acts as "travelers." Each traveler receives a place card.

Tell the travelers that the object of the game is to determine the best way to get to their destination considering the conditions indicated on their place cards. In order to do this, the travelers must first read their place cards then consult with the various transportation representatives to obtain information on cost and total trip time. Paper and pencils will be needed for this task. When a student arrives at an appropriate answer (mode of transportation and departure time), it is checked with you. Allow enough time for all students to complete their problems.

You should expect and permit a large amount of noise during the game, so plan the time it is to be used accordingly.

Special Rules. The following rules are explained to the students:

- Students' answers include mode of transportation, fare, and total trip time.

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*Students can work in pairs on each place card, making task less demanding on individual students and providing an opportunity for students to assist each other.

**Sample place cards and transportation schedules are provided at the end of the activity. You can paste them onto cardboard for durability before cutting them out and using them.

- Students figure out the costs only for one-way trips.

- All fares are given for one person.

At the conclusion of the game, the class discusses the following issues:

- What are some of the advantages and disadvantages of each mode of transportation?

- What is the reason(s) for having more than one mode of transportation available in any one community?

Place Card Trip Answers

1. Taxi - $8.10 - 20 minutes
2. Bus - 20¢ - 10 minutes
3. Trolley - 25¢ - 15 minutes
4. Automobile - $3.40 - 25 minutes
5. Trolley - 25¢ - 15 minutes

Daily Light Rail (Trolley) Schedule

1. Edgewater Street to
   Royal Avenue

   Take Black Line to
   Kings Road - Change
   Take Red Line to
   Royal Avenue

   Fare: 25¢

   Trip time: 15 minutes

2. Winter Street to
   Essex Street

   Take Green Line to
   North Hill Station-Change
   Orange Line to Weston Garden
   Walk 3 blocks to Essex St.

   Fare: 25¢

   Trip time: 25 minutes
   (including walking time)

3. Richmond Street to
   Bridge Street

   Take Green Line to
   Bridge Street Station

   Fare: 25¢

   Trip time: 15 minutes

4. Gloucester Road to
   Totten Road

   Take Blue Line to High St.
   Station - Change
   Aqua Line to Circus Road
   Station - Change
   Take Red Line to Totten Rd.

   Fare: 25¢
   Trip time: 20 minutes

5. Victory Street to
   Airport

   Trolley does not go
   to airport.

Daily Bus Schedule

1. Edgewater Street to *Royal Avenue*

   Take Bus #33

   Fare: 20¢

   Trip time: 20 minutes

2. Winter Street to *Essex Street*

   Take Bus #31 to
   Cary Road Stop - Change
   Bus #4 to Essex Street

   Fare: 40¢

   Trip time: 30 minutes

3. Richmond Street to *Bridge Street*

   Take Bus #12 to Sloane Sq.
   Bus #9 to Oxford Street
   Station - Change
   Bus #11 to Bridge Street

   Fare: 60¢

   Trip time: 40 minutes

4. Gloucester Road to *Totten Road*

   Take Bus #20

   Fare: 20¢

   Trip time: 10 minutes

5. Victory Street to the Airport

   Express Bus #2

   Fare: $1.00

   Trip time: 30 minutes

Automobile Schedule

1. Edgewater Street to *Royal Avenue*

Cost: 60¢

Parking fee: $2.50

Trip time: 25 minutes (including time to park car)

---

2. Winter Street to *Essex Street*

Cost: 90¢

Parking fee: $2.50

Trip time: 25 minutes (including time to park car)

---

3. Richmond Street to *Bridge Street*

Cost: $1.20
Parking fee: 50¢
Bridge toll: 30¢
Trip time: 35 minutes (including time to park car)

---

4. Gloucester Road to *Totten Road*

Cost: 60¢

Parking fee: $2.50

Trip time: 25 minutes (walk 5 blocks from where car is parked)

---

5. Victory Street to Airport

Cost: $1.50
Tunnel toll: 25¢
Parking fee: $6.00
Trip time: 40 minutes (including time to park car)

Daily Taxi Schedule

1. Edgewater Street to *Royal Avenue*

   Fare: $3.20

   Trip time: 15 minutes

2. Winter Street to *Essex Street*

   Fare: $5.30

   Trip time: 15 minutes

3. Richmond Street to *Bridge Street*

   Fare: $6.70

   Trip time: 25 minutes

4. Gloucester Road to *Totten Road*

   Fare: $3.20

   Trip time: 5 minutes

5. Victory Street to Airport

   Fare: $8.10

   Trip time: 20 minutes

Place Cards

1. $10.00

You are late. Your plane takes off at 10:30; it is now almost 10:00. You have to get to the airport in a hurry. You are standing on the corner of Victory Street staring at your watch. How do you get to the airport from here?

2. $1.00

You live on Gloucester Road. Your mother has asked you to stop off at the cleaners for her on your way to the movies. You said "Sure." As you were leaving, she gave you the cleaning: two suits, 3 dresses, 4 sweaters. You couldn't believe it. You could hardly carry it all. You were going to walk to the movies, but now you had best find an easier way to get from Gloucester Road to Totten Road than on foot.

3. $2.00

The play starts in exactly 30 minutes. You are supposed to meet a friend at the theatre, but knowing that there will probably be a huge crowd, you are afraid that you may never find each other. Unfortunately, you have both tickets, so you can't even meet each other in your seats. There must be a better place to meet. You are traveling from Edgewater Street to the theatre on Royal Avenue. Your friend lives on King Road

4. $4.00

You told your aunt that you would take her and her three poodles to the pet store so the dogs can get clipped. It is always a problem taking those dogs anyplace. They bark and jump around, and are generally disorderly. It makes your poor aunt very nervous to take them anywhere. You told her you would help her out and find the easiest and least disruptive way to get the dogs to the pet store. You and your aunt live on Winter Street, the pet store is on Essex Street.

5. $4.00

You have to pick up a birthday cake for your sister's party. You have a lot of things to do today to prepare for the party, so you don't want to waste time running errands. You live on Richmond Street and the bake shop is on Bridge Street.

ACTIVITY #39

Mini-unit Topic: Learning to Use Public Transportation

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students become familiar with local public transportation by working with route maps.

Objective:

At the end of the activity students will demonstrate their map reading skills by plotting a route between two points given the starting place and destination and an appropriate public transportation system map.

Concepts Treated.

- Public transportation route maps are an important travel aid.
- Some community public transportation systems are more efficient than others.

Materials Needed:

Route maps (see Spirit Master #9).

ACTIVITY

Obtain maps of local public transportation [bus, subway, train, light rail (trolley), ferry] routes. Each student or pair of students is given his or her own map with which to work. Students locate where they live and a place they go to or visit often (zoo, movie, beach, a friend or relative's house, swimming pool). They then determine if they can get there by one of the public transportation routes available to them on the map. The route is highlighted with a crayon or felt tip marker. Every time the student must change public transit lines or modes, the highlight color is changed. If there is no convenient route for the student by that mode of public transportation, the student either chooses another place to visit which is accessible by that mode of transportation or he or she decides on a place that can be visited by walking or riding his or her bicycle. If the student decides to walk or ride a bicycle, that route is indicated on the map with a broken or dotted line.

Students can then show their maps to the rest of the class, indicating where they are going, how they are getting there, and by what route. The class determines if the student has made an appropriate transportation decision. A list is kept on the chalkboard of how many students were or were not able to travel in the community by the type of public transportation assigned them. At the conclusion of the discussion, the class decides which mode (or modes), if any, is (are) most useful to them.

Students decorate their maps to make them as colorful and interesting as possible, emphasizing the mode of public transportation they are working with.

Students paste their maps onto sheets of cardboard. The maps are cut into pieces appropriate for jigsaw puzzles. Each puzzle is bagged and kept in a box with the other puzzles of that mode.

Students play with the puzzles in their spare time or they may be used for other special classroom projects.

Variations and Supplementary Activities

If there is no public transportation system in your city or town, you can obtain maps from other communities having extensive public transportation services or use the map of the Boston, Massachusetts transit system which is found on Spirit Master #9. Assign students a starting point and destination to facilitate the plotting of routes. The activity then proceeds hypothetically.

Maps can be exchanged so students get a chance to plot their trips by several different modes of public transportation available.

This activity can also be done as a class by projecting the map onto a wall.

ACTIVITY #40

Mini-unit Topic: Learning to Use Public Transportation **Approximate Class Time:** 1-2 periods

Capsule Activity Description: Students compile a community "Places to Go--Things to DO" booklet.

Objective:
Given a known point of interest in the community, students will write or orally relate the way or ways to get there from home or school and the route(s) to follow.

Concepts Treated:

- Most communities have more than one form of public transportation.
- It is helpful when using public transportation to know how to get where you want to go before you set out.

Materials Needed:
Paper, public transportation route maps.

ACTIVITY

As a class, brainstorm for favorite places or points of interest within the community. Break the class into small groups and assign each group a share of the identified places.

Students write short, one to four sentence descriptions of each place. They determine whether these places are accessible by public transportation, then find out how to get there by one or more of the modes available. This can be done by students examining systems maps obtained in the prior activity. If there is no way of getting to a certain place by public transportation, students indicate this at the end of the description.

Example

Hyde Park Zoo, 225 Hyde Park Drive

The zoo is a good place to visit in the spring or fall--it can be very hot there in the summer and sometimes smells bad. The snake house is a must to see, as are the bird cage, lions' den, and elephant grounds. If you don't bring a picnic lunch, buy a hotdog or two, they're really good. Admission is free for kids and $1.25 for adults.

To get there: The green line subway goes right by the zoo. Get off at Hyde Park Station. Bus #45 from the center of town also stops at the entrance to the zoo.

When the groups have completed their descriptions, they are read to the class. Students comment on them relative to clarity and appropriateness of content, as well as accuracy of mode and route decisions.

Descriptions are gathered and put into booklet form. The class gives its publication a name, such as *Places to Go--Things to Do, Having Fun in* ___________, *A Leisure Time Guide to* __________, *Where to Go in Your Free Time...How to Get There.*

Variations and Supplementary Activities:

Students can illustrate their descriptions.

If duplication is possible, copies of the booklet can be distributed to other students, parents, the community, school and neighborhood libraries.

Students can update their booklets periodically.

Students can test their directions for accuracy by visiting one or more of the places described in the booklet, using the booklet as a guide for getting there.

MINI-UNIT 11

USING PUBLIC TRANSPORTATION SAFELY

Although it is unlikely that most students will ever be involved in a major emergency on a public transportation vehicle, it is wise to make students aware that such emergencies can and do happen. Knowing what to do and what to expect in an emergency may help people to cope with one, should one occur. This mini-unit, by dealing with the coping theme, is a logical extension of Mini-units 9 and 10, both of which deal with learning to use public transportation. Knowing what to expect in various situations when using public transportation makes actually using it that much easier and safer.

This mini-unit offers students an opportunity to discuss various emergencies and what to do in those situations, and then to role play or act out skits demonstrating various kinds of behavior related to the use of public transportation.

The knowledge and skills developed in this unit are also transferable. Students will be better able to respond to emergency situations related to automobile, airplane, and bicycle travel by applying what they learn here to other transportation emergencies.

MINI-UNIT 11 LESSON PLAN

Using public transportation safely

Activity #	*Activities*	*Class Time*
41	DESCRIPTION: Students describe emergencies they have experienced involving personal safety and relate those emergencies to travel emergencies on public transportation vehicles. OBJECTIVE: By the end of the activity students will be able to demonstrate an awareness of emergency situations and the different ways of reacting to and and dealing with them by describing, through a role play, at least one way to cope safely within a given emergency situation.	1 period
42	DESCRIPTION: Students identify possible emergency situations on public transportation vehicles. OBJECTIVE: After completing the activity, students will be able to list the appropriate steps they should take in a given emergency situation.	1-2 periods
43	DESCRIPTION: Students perform skits demonstrating the procedures for proper and safe behavior while using public transportation. OBJECTIVE: By the end of the activity, students demonstrate knowledge of safe public transportation behavior by being able to describe orally (or in writing or a drawing) at least two potential problem areas to watch for when using public transportation and at least one way to cope with each.	1-2 periods

Total Class Time: 3-5 periods.

ACTIVITY #41

Mini-unit Topic: Using Public Transportation Safely

Approximate Class Time: 1 period

Capsule Activity Description: Students describe emergencies they have experienced involving personal safety and relate those emergencies to travel emergencies on public transportation vehicles.

Objective:

By the end of the activity students will be able to demonstrate an awareness of emergency situations and the different ways of reacting to and dealing with them by describing, through a role play, at least one way to cope safely with a given emergency situation.

Concept Treated:

- Knowing what to expect and how to act in an emergency can help one respond appropriately in a real situation.

ACTIVITY

There are several ways in which this activity can be conducted depending upon the level and writing ability of your students and upon their experiences. Students who do not write as well as others describe to the class incidents in which they were personally endangered and had to react quickly (or failed to do so and were injured or almost injured). Other students can write their stories and read them aloud. Students who have never personally experienced a situation in which they were in imminent danger of being hurt can either describe situations in which fast thinking or action was required to avoid an unpleasant occurrence (e.g., ice cream falling off a cone, lamp falling to the floor) or they can describe situations they have seen on television or in the movies in which somebody was in imminent danger of being hurt.

Examples of dangerous situations students may have been involved in where quick thinking or action was necessary or highly desirable include

- Falling out of a tree

- Losing control of or falling off a bicycle

- Falling down stairs
- Avoiding a falling or flying object
- Coping with an injury to a friend
- Rescuing someone drowning
- Being carried away from shore by a fast current
- Being lost
- Putting out a fire
- Rescuing someone from a fire
- Being outside during an earthquake or tornado
- Stopping bleeding from a deep cut
- Helping someone bit by an animal

After listening to each other's stories or reading each other's accounts, students discuss their experiences along the following lines:

1. Had the students received any prior warnings about how to behave should these emergency situations materialize?
2. Were they able to implement these suggestions when the emergency actually occurred?
3. If they had not received any prior emergency instructions, do they feel advance warning of what to do would have been helpful?
4. Did any students, without prior instructions about how to handle the emergency, respond correctly anyway?
5. Do students feel they would respond differently the next time a similar emergency occurred? the next time any emergency occurred? Why?
6. To what extent do people's reactions in an emergency depend on personality rather than learned behavior? For example, will some people always stay "cool" under pressure while others will always panic?

Students then identify sets of instructions they have been given at some time in their lives for how to react to emergencies, such as for fire drills; airplane emergency situations; various automobile emergency instructions; getting a cramp while swimming; coping with a snake bite, bee sting or tick; and earthquake drills. Regarding several of these instructions, students discuss whether they feel the instructions would be helpful if the corresponding emergency actually occurred. Students also consider whether repeated instructions tend to help when a crisis occurs or whether people tune out after a certain number of repititions.

The activity concludes with a discussion of instructions on what to do in an emergency, particularly an emergency situation on a bus, subway, ferry or train. Discussion points can include

1. What are some of the things people should do in a subway, train, or bus emergency?

2. Do people have to go through an emergency, perhaps several times, in order to be able to cope with one effectively? Are there some emergencies which require actual experience to handle properly while others can be dealt with effectively with prior instructions only?

3. Is there some advantage to being told in advance not (only) what to do in an emergency, but how one can expect to react or feel during one (e.g., panic, inability to move--"freezing")?

4. Are there emergencies in which people have time to think ahead either to avoid the emergency or, once it has occurred, to prevent its becoming more severe or being prolonged?

Variations and Supplementary Activities:

Students can poll friends or neighbors on how they have reacted in emergency situations and whether advance warning of how to respond was of any value.

Students can create emergency situations which other students must resolve by describing "correct" and "incorrect" ways to respond to the emergency situations.

Students role play people giving advice to others on how to handle specific emergencies should they arise. Situations can include travel emergencies on trains, buses, subways, and light rail.

ACTIVITY #42

Mini-unit Topic: Using Public Transportation Safely

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students identify possible emergency situations on public transportation vehicles.

Objective:

After completing the activity, students will be able to list the appropriate steps they should take in a given emergency situation.

Concepts Treated:

- There are appropriate and safe ways to respond to an emergency.
- It is a good practice to be prepared for an emergency should one happen on a public transportation vehicle.

ACTIVITY

Begin the activity with a short discussion in which you list the various types of emergencies that can occur on public transportation. You should point out initially that on a per mile basis there are fewer accidents, injuries, and fatalities related to public transportation than there are involving automobiles. Avoid giving students the impression that traveling by public transportation is dangerous.

The major emergency concerns involving travel by public transportation follow:

Train [including light rail (trolleys)]:	collision; power failure; derailment; fire.
Subway:	collision; power failure; derailment; fire, with the latter being the major concern because of the fact that passengers and crew are trapped in a tunnel and because fires are always a possibility in light of the high-voltage electric wiring.
Bus:	collision with other vehicle, or with stationary object; fire.

Ferry: going aground; sinking; fire. Fire is again a major concern because passengers cannot easily leave the ferry, unless they can swim, or have PFDs (personal flotation devices). Drowning is an added hazard.

From the summary above, it is clear that one of the major hazards of all vehicles is fire. The seriousness of fire depends on the surrounding circumstances--but particularly on whether passengers can quickly and easily leave the scene of the fire. This is difficult in subways, because of the tunnel situation (dark, danger of electrocution, insufficiency of oxygen especially as the fire consumes more and more of it); it is difficult in elevated trains because of the high structure and the danger of electrocution, but less dangerous that in subway tunnels. In both cases, however, there is as much or more danger from smoke and gases (carbon dioxide, carbon monoxide) as from the fire (flames) itself.

Fire on a ferry is especially dangerous, because jumping from the ferry can cause death by drowning. Personal flotation devices (PFDs) by law must be available but are not routinely worn by passengers who use a ferry for commuting as they sometimes are by persons going on a recreational boat ride.

The common factor in all these cases is that passengers must not be trapped, that they must be able to get out quickly. Hence the importance of knowing where emergency exits are, how to operate them, and what to do after you get out of the vehicle. (But the case of the commuter ferry is special; exits are not the problem, but where to go.) Even more important is avoidance of panic--i.e., actions that are irrational and endanger the person's life as well as everyone else's. Typical panic-induced actions are screaming, rushing toward an exit even if the way is blocked, jumping off high places or into water without consideration of what might happen. Panic is caused by the instinct to survive, but often results in just the opposite, if the actions taken are not rational or suited to the occasion. In order to avoid panic, passengers should know what to do before the need for action arises and should know how to act quickly and decisively without panic developing.

After the lecture, discuss with the students what to do in emergency situations. Ask them if any of them have been in emergencies on public transportation vehicles. Ask them to describe what happened.

Then read the story at the end of the activity and ask the class to finish it either orally or in writing. The class reacts to several completions along one or more of the following lines: realism of the story; creativity of the story; appropriateness of the safety measures taken in the story ending; and how they would change the story to make it better.

Finally, go over several of the more common emergencies and discuss what passengers should do, and especially what they can do *beforehand* to prepare themselves for emergency action. Among these actions are: locating the emergency exits on buses, subways, and elevated trains, and knowing how to open them; knowing how to open emergency windows (the push-out types). Other important things to remember are to follow instructions from the crew, to walk, not to run (to avoid falls and hurting other people), and to be extremely careful about live third rails.

Variations and Supplementary Activities:

Students can describe what actions they would take in case of emergency in school and compare this to actions on a public vehicle.

Students can role play various unsafe or hazardous situations prevalent in public transportation.

Students can write or illustrate a one-page flyer that outlines emergency procedures for a subway train that is stalled.

The Rapid Transit Emergency Story

George and his sister Jane were riding the new rapid transit train to get downtown. Neither George nor Jane had ever been on the train without their parents before, but this time George and Jane were in charge of the trip. They were taking their cousins, Michael and Liz, to show them the sights of the city. George was riding with Michael and Jane with Liz, pointing out the sights along the way. "You had better do a lot of looking right now," George said, "because in a few minutes we're going to go into the tunnel and then we won't be able to see anything."

"Is it completely dark when we go through the tunnel?" asked Mike. He seemed a little scared at the idea of travelling through a tunnel. But George reassured him. "No, no, there are lights in this train, and there are a few lights in the tunnel, too. But there is nothing to see--just the walls of the tunnel and a few cables. Sometimes you might see a red or green signal light flash by, but that's all."

"Do you go on this train often?" Liz asked Jane. She seemed very impressed with the shiny new train and how fast it was going and also with the fact that Jane and George were permitted to go on it alone.

"No, we've been on it a few times. It hasn't been running that long actually. The system was just opened last year. George and Dad and I went a couple of times to get to a ball game, and once we went with my mother to go shopping."

"You've never been on it alone before?" asked Jane, quite surprised.

"No, my parents thought it would be more fun for all of us if we went alone. They told us where to get off, at James Polk Square, and they'll meet us there. They are driving in, while we're taking the train."

Just then George turned around. "Do you know how many more stations before we get to Polk Square?" "Three or four, I'm not really sure. I thought you knew, George." Jane sounded just a little anxious.

"Of course I know," George said. "I wanted to know if you knew. Besides, do you see that list of stations that is posted up there? We've just left the Brookville station and you can read there are four more stations to go: 18th Street, Union Station, Alabama Avenue, and Polk Square."

"Just two more stations," George announced. "Alabama Avenue and then Polk Square. That's where we'll get off."

Just then the train slowed down. "Are we at Alabama Avenue already?" Mike asked; "I didn't hear him announce the station. I thought he was supposed to do that."

"He is," Jane said. "I wonder why he didn't." The train slowed more. "Maybe he isn't slowing for the station. Maybe he has a red signal ahead," George suggested. "The train has to stop for a red signal."

The train came to a complete stop, in the tunnel; there was no station visible. In fact, not much could be seen at all. The lights went out and dim emergency lights came on. For quite a while the train remained stopped. People talked in low voices, but remained seated. Finally, after about five minutes some voices were beginning to make themselves heard. "What's happening?" "Why aren't we moving?" "It's getting hot in here!" "Where's the conductor?"

Just then the conductor came on over the public address system. "Folks, we're stopped here by a red light. There is some problem with the train ahead of us, but we don't know exactly what it is yet. As soon as we find out more, we'll let you know. For now, just remain calm and stay in the car you are in. As soon as we know more, we'll pass it on to you."

"Well, that didn't tell us much," a man across the aisle from the four youngsters muttered. "I wish they'd hurry up and fix whatever needs fixing."

Liz and Michael were getting a little worried. This was clearly not the sort of thing that anybody had expected. Jane and George tried to appear calm and as though they knew exactly what to do, but neither one of them felt too good about this turn of events. "I bet Mom and Dad will be worried if we don't show up at James Polk Square when we are supposed to." "I hope they find out that the trains are stopped and don't think we got off at the wrong stop."

"Well, they know we can read; we wouldn't be dumb enough to get off where we aren't supposed to." Then everybody fell silent again.

The conductor's voice broke the silence. "We have some definite news now, folks. The problem is that a fire broke out in the train ahead of us. That caused a short circuit and that's why the lights went out. They have told us to get everybody off the train. We'll have to walk back. Use the rear door of the train and walk back to the Union Station stop. We aren't very far from it, about half a mile. I'll lead you. I will be coming through the train, to unlock the back and help you down. The power is off, but it would be smart to stay away from the third rail anyhow. And walk slowly.

"All right everybody. Wait for me, and we'll start walking back."

Everybody, including the kids, were kind of stunned and remained silent for a moment or two. Then voices started to rise, and a general babble began. "How could this be?" "How far is it?" "Is it safe?" "What's the third rail?" Mike asked. "That's a rail that was beside the regular tracks. It's raised up on special supports." George told him. "The electricity for the train runs through the third rail, but the conductor said it has been turned off." Then the end door of the car opened and the conductor appeared.

Now finish the story.

ACTIVITY #43

Mini-unit Topic: Using Public Transportation Safely

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students perform skits demonstrating the procedures for proper and safe behavior while using public transportation.

Objective:

By the end of the activity, students demonstrate knowledge of safe public transportation behavior by being able to describe orally (or in writing or a drawing) at least two potential problem areas to watch for when using public transportation and at least one way to cope with each.

Concepts Treated:

- One can learn what to expect and how to act in an emergency.
- There are certain things to be aware of while using public transportation which will help to ensure one's safety.

ACTIVITY

Working in small groups, students write and rehearse skits for other students and their parents, alerting them to the proper ways to use public transportation and appropriate safety measures. Assign or ask groups to choose a topic to present in skit form. For example

- How to act in an emergency situation (fire, collision, falling on tracks)
- How to check the public transportation vehicle you are using for safety features and knowing how these features operate
- How to get on and off public transportation vehicles safely
- Things to know and/or carry while traveling on a public transportation vehicle (correct change, system maps, station stops, information center and complaint department locations)
- Special safety problems of elderly, young children, and handicapped, and how to cope with these hazards

Each group presents its skit to the other students who act as critics, judging the material according to the following criteria:

1. Does the skit or message convey its intention?

2. Is there too little or too much information in the skit? What, if anything, should be added or deleted?

3. Did you learn anything from the skit? Do you think others will?

Keeping class comments in mind, groups revise their skits accordingly for presentation to other classes and parents.

Variations and Supplementary Activities:

Students can check their information for accuracy with a public transportation employee either by an interview or guest lecture/visit.

Students can conduct a poll of the community to find out what safety information about public transportation is most needed and least known by the average citizen.

Students can write up their basic skit facts and compile a public transportation safety guide.

MINI-UNIT 12

DESIGNING AN EFFICIENT PUBLIC TRANSPORTATION SYSTEM

Mini-unit 12 involves students in designing their own public transportation system and then promoting it by means of an advertising campaign. Students are introduced to the many components that go into public transportation, from funding the system, to determining system routes, to setting fares. Upon completion of their systems, students engage in promoting them. They determine the advantages and benefits of their particular form of public transportation and how best to make the community aware of these features.

Besides increasing understanding and knowledge of public transportation, the mini-unit--especially Activity #46--reinforces several language arts skills, including creative thinking and writing.

Major transportation concepts developed in these activities follow:

- Some communities need public transportation more importantly or more extensively than other communities.
- Certain steps and considerations must be included when planning a public transportation system.
- There are advantages and disadvantages to every mode of transportation.

MINI-UNIT 12 LESSON PLAN

Designing an efficient public transportation system

Activity #	*Activities*	*Class Time*
44 Spirit Master #10	DESCRIPTION: Students plan a public transportation system for their community. OBJECTIVE: By the end of the activity, students will be able to: (1) label the points on a given map showing areas of the community that need the highest concentration of public transportation routes and explain why; and (2) label those areas where public transportation is needed less or not at all and explain why.	1 period
45	DESCRIPTION: Students design their own public transportation system. OBJECTIVE: By the end of the activity, students will be able to demonstrate knowledge of the components of a public transportation system. Given a system, students list all the elements it contains that are necessary and unnecessary to its proper functioning, as well as list any elements that might be missing.	3-4 periods
46	DESCRIPTION: Students develop advertising campaigns for public transportation. OBJECTIVE: By the end of the activity, students will be able to give (orally or in writing) the reasons why public transportation is a practical way to travel.	1½-3 periods

Total Class Time: 5½-8 periods.

ACTIVITY #44

Mini-unit Topic: Designing an Efficient Public Transportation System

Approximate Class Time: 1 period

Capsule Activity Description: Students plan a public transportation system for their community.

Objective:

By the end of the activity, students will be able to: (1) label the points on a given map showing areas of the community that need the highest concentration of public transportation routes and explain why; and (2) label those areas where public transportation is needed less or not at all and explain why.

Concepts Treated:

- Some communities need public transportation more extensively than other communities.
- Certain steps and considerations must be included when planning a public transportation system.

Materials Needed:

Community map or Spirit Master #10, art materials.

ACTIVITY

Divide your class into small groups of three or four students. Provide each group with a map of your city or town or you may use the map of the fictitious town which is attached (Spirit Master #10). The students, using the map provided, lay out a public transportation system (e.g., bus, light rail) for the community. It is best to keep the systems simple at first and plan for only one mode of transportation.

Discuss with the class some or all of the following points necessary for the planning of a public transportation system. The items may be listed on the chalkboard and left to the students to deal with and discuss within their groups, or the class may spend time together going over the various points in detail. Use your discretion, based on your students' ability level, to decide which points you would like your students to consider while planning their systems.

When planning a public transportation system, consider

- Target service areas including areas which have a high population density; areas with a high concentration of jobs and shopping activities; and other areas such as hospitals and recreation facilities (parks, sports stadiums, and swimming areas).
- The effects of high and low traffic density on the flow of public transportation must be considered. Would bus-only lanes be feasible and advisable in certain high density areas? Would automobile-free zones be of any assistance?
- Areas in the community where public transportation would not be necessary or feasible.
- Times of day when the system is necessary.
- Decision factors for determining which system is more suitable for the community can include: available funds (see discussion of funding at end of activity for needed background information), construction costs, need, and environmental effects.
- Different modes of transportation should be connected in some way.

When students are familiar with the needs and problems of their community, they lay out their systems according to a set number of stops and route miles. You may wish to establish these criteria yourself, according to the nature of your community and the type of map your students are using. For example,

> Sixty stops along 10 miles of route for a community with a population of _____ and covering an area of _____ miles.

The groups may not exceed the criteria you set forth.

Routes are drawn on the maps in different colors and all stops are clearly indicated with a design of the group's choice. All possible transfer points are marked in a similar fashion. The systems are to be as efficient as possible and reflect the community's needs.

When the systems are mapped out, each group of students presents its public transportation system to the class, defending its system, and the reasons for route and stop placement.

The systems are compared and discussed. Three or four of the best systems are chosen for further discussion and refinement, and the class adopts one plan for construction.

If your community already has a public ground transportation system, group plans can be compared to the system in existence and all existing and proposed systems evaluated in light of the community's present needs.

Variations and Supplementary Activities:

Each group can work with a different number of stops and allowable route miles and the resulting systems of varying dimensions are compared according to efficiency, convenience, and cost.

System plans can be pasted onto cardboard and cut into pieces for jigsaw puzzles.

A transportation planner can come to class to further discuss how a transportation system is developed and to evaluate group plans.

More advanced students can develop a system having more than one mode of transportation.

Students can hold classroom hearings on one or more of their alternatives for a public transportation system, e.g., raising fares, changing bus routes.

Federal Funding of Public Transportation

Federal assistance for mass transportation began in 1961 with an emergency loan program and a small test and demonstration program. In 1964, the Urban Mass Transportation Act established a program of Federal matching grants for preservation, improvement and expansion of public transportation systems. Amendments to this Act have provided broader program goals, higher funding levels, longer periods of assured Federal assistance, and greater flexibility in meeting local needs. Funding increased from 50.7 million dollars in 1965 to 133 million dollars in 1970 to over 1.4 billion dollars in 1976 for the purchase and construction of mass transportation facilities.

The Federal-aid Highway Act of 1973 granted flexibility in the use of highway funds for public transportation purposes by opening Urban System funds (previously targeted solely for highways) to transit, both rail and bus; and by opening all highway funds to exclusive lanes for buses, traffic control devices, bus shelters, parking facilities, etc. In addition, interstate highway funds also were made available for non-highway public transportation purposes under certain conditions.

Federal Components. The Urban Mass Transportation Administration (UMTA) of the U.S. Department of Transportation bears the principal Federal responsibility for providing assistance to public transportation. In addition, the UMTA cooperates extensively with the Federal Highway Administration (also of the Department of Transportation) in providing a coordinated Federal approach to public transportation programs. Both administrations also work cooperatively with the U.S. Department of Housing and Urban Development and the Department of Health, Education and Welfare.

Immediate Goals. The Federal government assists and promotes public transportation systems through programs of financial aid to local public bodies, and through research, development, and demonstration grants. Specific goals include

- *Mobility of nondrivers.* This objective is directed to identifying, studying, and ultimately serving the transportation needs of the transportation disadvantaged--the young, aged, poor, handicapped, unemployed, and secondary workers. These groups include those who generally do not have reasonable access to alternative forms of transportation and are often deprived of mobility where public transportation is inadequate or nonexistent.

- *Relief of traffic congestion.* This objective seeks improvement in overall traffic movement and travel time in urban regions especially during peak hours of travel demands.

- *Improving the quality of urban environment.* This objective requires achievement of land use patterns and environmental conditions that effectively contribute to the physical, economic, and social well-being of urban communities. Public transportation improvements--designed to help reduce the noise, odor, vibration, and other adverse impacts on the urban environment--are to be encouraged as a contribution to the improvement of the environment.*

Examples of Federal Assistance. Some of these are given below.

- *Capital improvement and planning grants.* These grants are awarded to local public bodies and provide 80 percent of the cost for new system equipment and modernization of transit facilities. Local bodies provide the remaining 20 percent of the costs.
- *Operating assistance grants.* These grants are awarded to local public bodies and provide up to 50 percent of the cost of operating a transit system.
- *Research, development, and demonstration.* These grants are provided to organizations, private and public, for studies, tests, and demonstrations of new ideas, methods, systems, and equipment for improved transportation planning and operations.
- *Technical studies grants.* These grants are awarded to local public bodies, and provide up to 100 percent (UMTA administrative policy dictates 80 percent) of the cost for engineering plans and design of urban mass transportation systems, and for other planning studies.
- *Managerial training grants.* These grants are awarded to personnel employed in managerial, technical, and professional positions in the urban mass transportation field for advanced training.
- *University research and transportation grants.* These grants are awarded to nonprofit educational institutions and combine comprehensive research and research training in urban transportation problems.
- *Rural highway public transportation program.* These grants are available to public bodies to test possible methods of improving transportation services for rural residents.

The Grant Process. Each program of the Federal government has specific procedures and requirements for funding. Given below is an example of the grant process for UMTA capital grants.

> Public bodies must submit a preliminary application for purpose of ascertaining the probable eligibility of the applicant and project and the availability of Federal funds. If a positive decision is reached,

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*Excerpts from UMTA Operating Manual.

then detailed engineering, planning, financial, and legal data must be set forth in a final application. Any application for capital grants must include a transcript of certification that a public hearing was held on the proposed project prior to submittal of the final application.

The preliminary application must include such items as: a list of capital facilities for which the grant is requested; description of current system; benefits to be derived; estimates of the total cost; portion to be financed from local revenues and the source of such funds; arrangements which exist or will be made to insure continuing public control over the operation or use of facilities. The application must indicate whether the project will adversely affect employees of the transit system or result in relocation of families or business and must include draft environmental analysis.

Priority for UMTA capital grants is given to funding proposals which:

- Reinvigorate public transportation in order to provide service that will attract new riders regardless of their social or economic group of the purpose of their journey

- Provide better general service and develop special services to provide for substantial groups of people who are totally dependent on public transportation

- Promote transit as a positive force in influencing and supporting desired development patterns in urban areas and improving environmental conditions

Future Federal Directions. Some of these are

- To provide general fund financial assistance to help urban areas improve the quality and quantity of public transit.

- To encourage local urban planners to bear more of the burden of deciding which of the many competing programs they wish to promote given the limits of financial resources, and which they will defer. These are decisions that can best be made at the local level, with Federal help in providing the data, guidelines, and criteria needed to make prudent decisions.

- To develop and encourage local areas to implement various incentive systems to force more efficient vehicular usage of our existing streets and highways.

- To continue to seek better mass transit technology, such as improved bus design.

ACTIVITY #45

Mini-unit Topic: Designing An Efficient Public Transportation System **Approximate Class Time:** 3-4 periods

Capsule Activity Description: Students design their own public transportation system.

Objective:

By the end of the activity, students will be able to demonstrate knowledge of the components of a public transportation system. Given a system, students list all the elements it contains that are necessary and unnecessary to its proper functioning, as well as list any elements that might be missing.

Concepts Treated:

- There are many components in a public transportation system.
- There are both advantages and disadvantages to different forms of public transportation.

Materials Needed:

Construction paper, crayons, and any other necessary art supplies.

ACTIVITY

Discuss with the class the basic components of a public transportation system. (See list below for these components.) As these elements are discussed, list them on the chalkboard. Working in groups, students are given instructions to make up plans for a public transportation system. Instructions should include, but not be limited to, the following:

- Select a mode of public transportation (bus, train, subway, light rail, cable car, ferry, taxi), keeping in mind the needs of the elderly and handicapped.
- Design station facilities or shelters.

- Draw a route map of your system, indicating location and names of stops and illustrating community landmarks.

- Draw signs for your system--station names, directional markings, and signs.

- Write or illustrate a public transportation booklet to include how to use the facilities; the safety and convenience features of the vehicles and other facilities; the fare; the listings of stations or stops; and reasons for using this mode rather than the automobile.

When the projects are completed, a group spokesperson presents the system to the class, explaining and describing its features and facilities. The systems may be put on display for viewing by other classes and parents.

Variations and Supplementary Activities:

A field trip to a public transportation facility can be helpful as background for this activity.

Student present their projects to other students, explaining how to use the systems and their benefits. Students can judge the systems and award prizes based on safety, convenience, and design of facilities.

If students are unsure of all the modes of public transportation, you can review the various vehicles with the class prior to this activity.

Students can combine the best features of each system and develop the ideal system.

Students can design their own mode of public transportation and develop their systems around this new form of travel. Remind them that their systems should accommodate the needs of the elderly and the handicapped.

ACTIVITY #46

Mini-unit Topic: Designing An Efficient Public Transportation System

Approximate Class Time: 1½-3 periods

Capsule Activity Description: Students develop advertising campaigns for public transportation.

Objective:

By the end of the activity, students will be able to give (orally or in writing) the reasons why public transportation is a practical way to travel.

Concepts Treated:

- There is a need for more than one mode of transportation.
- There are advantages and disadvantages to every mode of transportation.

Materials Needed:

Art supplies.

ACTIVITY

Small groups of students act as advertising agencies for a public transportation system of their own choosing. You may wish to form new groups for this activity or use the same groups as were used in Activity #45. Their task is to make the community more aware of public transportation and what it has to offer in the way of comfort, safety, cost, and convenience.

The groups are to produce

1. A slogan (e.g., Buses are Beautiful, Subways are for Swiftness, Call a Cab/Take a Taxi)

2. A television commercial

3. A newspaper advertisement

4. Posters and/or brochures

5. A "gimmick" to increase ridership (e.g., free buttons promoting ridership; reduced fare; door prizes; free rides)

When the projects have been completed, the groups present their commercials and display their slogans or posters. Students explain their reasons for choosing the points they stressed in the advertising. For example:

- Why was safety stressed in your newspaper advertisement, and convenience and comfort made the focus of your television commercial?
- Why do you think the gimmick you chose to increase ridership would be effective and appeal to commuters?
- Do you think advertising helps promote one form of transportation over another?
- Do you think it is good that there are different ways to get around?

After the presentations, each student casts a ballot for the best advertising in the following categories:

1. Best television commerical
2. Most clever gimmick
3. Most eye-catching slogans, posters, and newspaper advertisement
4. Best overall advertising effort

Variations and Supplementary Activities:

The groups can make their presentations to another class.

The students can contact the various community public transportation facilities to assess interest in their advertising project and enlist their support for a school and community publicity drive.

Students can gear their advertising campaigns toward the reduction of vandalism against public transportation vehicles and facilities.

Groups can exchange projects and evaluate the material according to appropriateness and accuracy of information, clarity, and eye appeal.

SUPPLEMENTARY ACTIVITIES

Activity #47, which follows, can be used either in conjunction with one of the mini-units or individually, by itself.

Activity #48, the last activity, suggests quiz questions you can use after teaching one or more of the mini-units or individual activities.

ACTIVITY #47

Supplementary Activity Approximate Class Time: 1 period

Capsule Activity Description: Students role play scenarios involving operators of public transportation.

Objective:

By the end of the activity students will be able to demonstrate knowledge of appropriate public transportation employee and passenger behavior. Given a specific conflict situation involving a public transportation passenger and employee, students determine the most appropriate behavior for each.

Concepts Treated:

- There are appropriate transportation user and employee behaviors that should be learned.
- There are certain problems associated with public transportation.
- There are ways to cope with public transportation problems.

ACTIVITY

Students role play operators of public transportation and their passengers in day-to-day occurences and situations. Sample role profiles appear at the end of the activity.

Choose students for each part, then proceed with the role plays following one of two options.

1. Send the students from the room or out of hearing. Read the profiles to the class and, if desired, briefly discuss the situation. Call the students back into the room. Each one then reads his or her role profile to him- or herself.

2. Have the students chosen for the role play read their profiles silently to themselves, act the situation out and then read them to the class.

The option you choose will, to some extent, determine the direction your discussion takes.

After each role play, participants discuss the feelings they had while role playing. For example, the operators of the vehicles relate how they felt while in that particular situation. The passengers relate their feelings about the same situation. Non-participants discuss the pros and cons of each occupation role played and the public's expectations of the people who hold these jobs. List on the chalkboard the skills and personality traits, as seen by the students, necessary for each job. Another list is drawn up of ways in which passengers and other motorists can aid operators of public transportation vehicles, and by so doing, help themselves.

Variations and Supplementary Activities:

You can invite someone from the personnel office of a public transportation system to explain to the class what skills and characteristics the company looks for in its employees and how the public can help improve service and make the system more responsive to its demands.

Students can develop the ideal public transportation employee and ideal passenger. Students can write their own role profiles and act them out. Students can draw up work and travel guidelines for public transportation employees and passengers.

Rainy Day

Bus Driver

This is the first run of the day and already you are behind schedule. It is raining cats and dogs. The traffic is moving very slowly, you are upset, and your passengers are angry because the bus is late and they are wet. You try to do your best to stay on schedule and get people where they are going on time, but it's not always easy. Anyway, what can you do to improve the weather or the traffic? It's days like today that make you wish you had never learned to drive.

Passenger

The rain has to stop. This is the second time this week that is has poured which means it will be the second time in a week you will be late for work and arrive soaking wet as well. You can't understand why it always takes longer for the bus to get places when it rains--you think service should be better on those days. And the shelter at the bus stop is too small for all the people who wait there. Again today you are standing out in the rain with no umbrella, getting very wet. And, when the bus does get here all the seats will be taken. You are getting madder and madder with each passing minute. If and when that bus gets here you are going to give the driver a "piece of your mind."

Hot Day

Taxi Driver

You have been driving a taxi for 22 years. You have always liked your job--it gives you freedom, you meet people, and you always know what is happening in and around the city. The only time the job bothers you is when you have to work a lot of overtime. Usually that happens in the summer when other drivers go on vacation and you have to cover for them. It is then that driving becomes tiresome, traffic is at its worst, and the heat is unbearable. During those times you find that if you talk to your customers you can stay awake, and if you drive fast enough you stir up a breeze in the cab. You see someone standing on the sidewalk who looks as if he (she) wants to go to the airport. You hope so, at least driving to the airport will get you out of this hot city for a while.

Passenger

It's really too early to go to the airport, your plane doesn't leave for at least two hours. But there really isn't enough time to go to a museum or anything so you may as well get in a cab and go to the airport. You have always loved this city, it's too bad you can't stay longer. You decide to ask the cab driver to take the long way to the airport, through all those wonderful narrow, winding streets. You want to look around and remember all the good times you spent here while you were in college. Wow, it really is hot today, you hadn't noticed that before. You're lucky the heat doesn't bother you or you would probably be roasting. Oh good, here comes a cab now. This should be a fun trip to the airport.

ACTIVITY #48

Supplementary Activity   Approximate Class Time: ½-1 period

Capsule Activity Description: Students answer questions on public transportation.

Objective:
To evaluate what information students have learned during their study of public transportation.

ACTIVITY

A series of questions on public transportation follows. You will want to choose only those questions which treat aspects of public transportation which your students have studied.

These quiz questions can be used to evaluate a mini-unit or to supplement the evaluation methods included in the activities.

1. Circle the ways to travel that are listed below that are used as *public* transportation.

   Subway
   Bicycle
   Bus
   Ferry
   Car
   Motorcycle
   Trolley
   Taxi

2. List some of the reasons why people use or don't use public transportation.

3. Pretend you work for the bus system in your town. You are planning on adding ten buses to your system. For two weeks before the buses are to start running you are going to do a lot of advertising. You want to let the whole town know how good the buses are and let people know why they should ride them. What are some of the things you would plan to do and why would they be helpful.

4. If you were taking the bus for the first time, what are some things that might make your trip easier? List as many as you can think of.

   (a) Knowing where to get off

   (b) Having a friend with you

   (c)

   (d)

   (e)

   (f)

   (g)

   (h)

5. If your community has public transportation describe some of the good things and bad things about it, and tell why they are good or bad. If your community does not have public transportation, why do you think it doesn't and does it need it?

6. You want to go to the library to return some books before they are overdue and you have to pay a fine. You have five big books to return and you really don't want to carry them all the way to the library. The library isn't very far away but the books are very heavy. You could ride your bike to the library, take the bus, or ask your mother to take you in the car. What do you decide to do and why?

7. What are the differences (if there are any) between public transportation vehicles and other types of vehicles?

8. What would be the ideal public transportation vehicle for your community and why? This vehicle can be real or one created by you.

9. Pretend you are on the subway going home after a very difficult day at work. The weather outside is hot and it is even hotter inside the subway car. People are jammed in like sardines. The car has just stopped at the Smith Street Station which is the stop just outside the tunnel leading to your station. Some people got off but more seemed to get on. The subway starts up and is about to enter the tunnel when the breaks are suddenly applied and there is a terrific crash. People seem to be falling everywhere. You suddenly find yourself on the floor but don't seem to be hurt. You hear people shouting and crying. What do you do now?

Glossary

Articulated bus is two buses joined together to allow a shorter turning radius on city streets. It needs only one driver and can carry 70 people. These buses have been used in Europe for a number of years but they are just now being added to the American public transportation network.

Cable car is a railway vehicle which operates in street traffic. It is propelled by moving cables located below the street surface and powered by engines or motors at a central location not on board the vehicle.

Demand-responsive vehicle is relatively new in American transportation. It has the features of a taxi and a bus and usually looks like a van. People call for service like they do for a taxi, but they pay lower fares and may ride with several other people going to a similar destination.

Double decker bus is a rubber-tired self-propelled vehicle which has two levels enabling it to carry twice as many passengers. It has been used extensively in Europe and is now being reintroduced to American public transportation.

Heavy rail (subway/elevated) is a subway-type railway vehicle constructed on high-level platform stations.

Hydrofoil is a boat which travels on the surface of the water rather than in the water. This enables it to move much faster than ordinary boats.

Light rail (trolley) is the term usually given to the streetcar-type railway vehicle. Light rail is constructed and operates on city streets.

Public transportation refers to all modes of travel which operate within a community (as opposed to modes operating between cities and towns) and which involve vehicles which are publicly owned (e.g., by the government) or owned by private business (e.g., a taxi company) (as opposed to vehicles which are owned by private citizens, including automobiles, bicycles, and recreational vehicles). Public transportation also includes the facilities (e.g., bus shop shelters and ferry docks) which serve public transportation vehicles and passengers.

BIBLIOGRAPHY

BIBLIOGRAPHY

The Bibliography contains educational materials for classroom use and for use by teachers in developing relevant units of study on public transportation. It consists of selected

- Materials for teachers
- Additional background materials for teachers
- Materials for students
- Periodicals

The individual entries in the materials for teachers section are presented in the following format:

**	*Title of Work,* author, date of publication. Number of pages or list of materials. Price.
Type of Material	Description of material with evaluation of material's quality and relevance for transportation consumer education.
	Source from which material may be obtained.*

For purposes of convenience, the teacher materials have been rated by the designation of stars next to the material description. (See sample above.) The stars represent the authors' evaluation based on the following scale:

No stars:	material is useful, but fair
(*) One star:	material is good
(**) Two stars:	material is very good
(***) Three stars:	material is excellent

It should be kept in mind that these evaluations are an estimation of the material's *quality and relevance.*** As such, the absence of a teaching material or a low rating does not per se indicate the material is poor. It may be excellent but simply not relevant to the Manual's content. In addition, any absences may be due to the authors' oversight.

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*Allow ten weeks for delivery of items ordered from the U.S. Government Printing Office.

**A complete discussion of the criteria used to evaluate the materials may be found on pages 468 & 469.

At the end of the Manual is a list of government agencies which can be contacted for further information about public transportation.

** *Transportation: World of Work Project,* no date. 33 pages. Price available on request.

Guide

Unique guide organized around four concepts, "There are many ways to travel," "The bus driver is an important public servant," "The cab driver is an important public servant," and "The truck driver has an important job." For each concept, resources and classroom activities are suggested. The activities are creative but, with a few exceptions, not detailed. An entire game around traveling by bus is included along with a paper game "board" and play money. Although designed for Grade 4, guide can be used with Grades 2-6.

Utah State Department of Public Instruction
Vocational Education Division
Occupational Education Program for Children
136 East South Temple
Salt Lake City, Utah

*** *The Voice of the Transportation Consumer: Executive Summary,* 1975. 108 pages. $5.25.

Pamphlet
Report

This is a comprehensive and forthright "Report to the Secretary of Transportation on Nationwide Consumer Public Hearings Conducted by the (Department of Transportation) Office of Consumer Affairs during 1971-1974. Presents in summary but highly readable fashion the results of 54 hearings conducted in 34 cities and towns. The report analyzes 1,280 complete questionnaires received at the hearings. The report covers all aspects of transportation, but indirectly treats public transportation. A full report of the hearing results is also available and runs to 656 pages.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Catalog No. PB 241764

*** *Improving Urban Mobility,* 1975. 30 pages. Free.

Pamphlet

Highly creative discussion of ways in which bus service can be improved by manipulating the traffic environment and bus system. Discussion focuses on special bus lanes and streets, improved traffic management, improved scheduling and routing, improved fare collection methods, and alternate vehicle types.

Federal Highway Administration
Urban Planning Division
Transit and Traffic Engineering Branch
Washington, D.C. 20590

** *Access for All: Transportation and Urban Growth,* 1975. 176 pages. $2.45, paperback.

Book Stimulating discussion of how transportation availability influences residential, work, and recreational patterns. Thesis is that the introduction of the automobile has resulted in unequal access to transportation in America. Full of revealing insights into the nature of public transportation, but some readers may find some of the reading "heavy" and the illustrations (e.g., Boston) parochial.

Penguin Books
7110 Ambassador Road
Baltimore, Maryland 11207
or local bookstore

* *Transportation and the Rural Community,* 1974. 19 pages.

Pamphlet/Report Summary of conference on rural transportation. Report treats present state of rural transit, the relationship between transportation and rural development, and the potential of new technology as a solution to rural problems.

National Technical Information Service
5825 Port Royal Road
Springfield, Virginia 22151

** *Transportation Noise Pollution: Control and Abatement,* 1970. 190 pages. $6.00.

Pamphlet Very informative, in places technical discussion of the causes of transportation noise pollution and what can be done about them. Excellent charts, graphs, and cartoons.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Stock No. N71-15557

** *Readings for the Eco-Activist,* 1972. 41 pages. Price not listed.

Bibliography A bibliography of environmental publications of the Federal government for young persons interested in involvement in environmental problems. There are chapters on air, water, and noise pollution that include materials on transportation pollution.

Division of Information Services
Office of Library Services
U.S. Department of the Interior
Washington, D.C. 20240

*** *Neighborhood: Community Planning and Urban Issues.* Kit. $20.00.

Game Students develop planning skills and learn about community issues as they compete to build the ideal residential community. The object of the game is to achieve the ideal balance of accessibility from residential units to jobs and other public facilities using public transportation links.

Games Central
55 Wheeler Street
Cambridge, Massachusetts 02138

*** *Transportation.* Kit. $24.00.

Game This game promotes both basic math skills and an understanding of the decision-making process inherent in selecting a mode of transportation. Travelers must wrestle with time and budget limitations as they shop comparatively for different travel modes. Although the game deals with forms of travel other than public transportation the skills learned are transferable.

Games Central
55 Wheeler Street
Cambridge, Massachusetts 02138

Additional Background Materials for Teachers

The materials are listed alphabetically by author under each public transportation topic.

Environment and Transportation

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Crouse, Wm. H. *Automotive Emission Control.* (McGraw-Hill, New York: 1971).

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Voorhees, Alan M., and Associates. *A Guide for Reducing Automotive Air Pollution.* (Available from National Technical Information Service, Springfield, Virginia 22151: Catalogue #PB 204870: 1971).

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Buses, Subways, Taxis, Trolleys

Buel, Ronald A. *Dead End: The Automobile in Mass Transportation.* (Prentice Hall, Englewood Cliffs, NJ: 1972).

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Periodicals

In addition to the periodicals listed below, teachers and students can also consult in libraries the *Reader's Guide to Periodical Literature* for past articles on public transportation.

Highway and Urban Mass Transportation
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

High Speed Ground Transportation Journal
International Society for Terrain-Vehicle Systems
Box 4824, Duke Station
Durham, N.C. 27706

IRT Newsletter
Institute for Rapid Transit
Suite 508, 1612 K. St., N.W.
Washington, D.C. 20006

Mass Transit
538 National Press Building
Washington D.C. 20045

Transit Journal
The American Public Transit Association
1100 17th Street, N.W.
Washington, D.C. 20036

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Department of Transportation
Office of the Secretary
Washington, D.C. 20590

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U.S. Department of Transportation
Office of Public Affairs
400 7th and D Streets, S.W.
Washington, D.C. 20590

TRANSPORTATION AND THE ENVIRONMENT

WHY TEACH ABOUT TRANSPORTATION AND THE ENVIRONMENT*

The Problems

American consumers are the purchasers and users of personal transportation goods and services amounting to nearly 124 billion dollars every year.

Transportation and the environment are in many respects in a state of conflict. Transportation vehicles and facilities cause damage to the environment. The motor vehicle is still a major pollutant of our air, even with improvements in the control of auto emissions. Heavy traffic congestion clogs roads and city streets (77 percent of the nation's workforce commutes to work every day by private automobile; more than 70 percent of these people drive alone). Eighteen percent of the nation's energy supply is consumed by motor vehicle transportation; and nearly 80 percent of this amount is for personal travel by car, truck, or bus. (Early 1976 figures indicated an increase in vehicle fuel consumption, reverting to patterns that had been prevalent before 1974 and 1975 when Americans reduced the vehicle fuel consumption in response to the immediate fuel crisis.) Motor vehicle use is responsible for much of the visual pollution of our countryside; billboards, litter, automobile junkyards, as well as many badly designed gas stations, parking lots, and bus stations.

Transportation vehicles and facilities also enhance or preserve the environment in numerous ways and make scenic areas more accessible to the public. These beneficial effects must be balanced against the damage transportation causes to the environment.

It must be remembered that the environment, in turn, can interfere with transportation. Natural obstructions to visibility, confusing traffic signs, and poorly designed roads are obstacles that hamper travel safety, comfort, and convenience.

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*For the purpose of this Manual we have defined "environment" broadly to include a wide variety of factors that interact with travel, including natural resources, residential patterns, land space, and visual obstructions. The concept includes both the natural environment and the manmade environment.

We must work to bring transportation and the environment into balance with one another by shifting emphasis from environmentally damaging forms of transportation to modes of travel which do not harm the environment unnecessarily.

The Solutions

Federal and state governments must promote balanced transportation by providing assistance for planning, development, and financing of improved transportation systems; enact legislation which will lessen conflicts between transportation and the environment; and encourage private industry to develop and promote vehicles that are more energy-efficient and less polluting. Local transit authorities can generate greater use of their services by making public transportation more accessible and attractive to the daily traveler.

Citizens/consumers should become informed about national and local transportation and environmental problems and participate in their solution by individual personal actions and by community involvement.

Teachers can guide students to a better understanding of the causes and effects of transportation and environmental problems, and of possible solutions. Transportation consumer education can offer the student a unique opportunity to develop awareness and skills essential to acquiring responsible transportation and environmental habits and to play a role in balancing the often conflicting needs of transportation and the environment in the community.

This chapter focuses on developing consumer skills that are particularly appropriate to students in grades 4-6. The learning activities are designed to

- Stimulate students' awareness and understanding of transportation and environmental issues
- Establish the concept that transportation vehicles and facilities have both good and bad effects on the environment

- Teach about a few of the unique effects automobiles have on the environment--both harmful and beneficial

- Acquaint students with actions currently being taken by government and individuals to reduce transportation's harmful effects on the environment

TRANSPORTATION AND THE ENVIRONMENT

Mini-unit 13

The effects of transportation on the environment

Activity #	*Activity Description*	*Class Time[a] (periods)*
49	Students define "transportation" and "environment" and identify the effects of each on the other.	½-1
50	Students analyze songs about transportation's effects on the environment and compose songs on their own.	1
51	Students engage in one or more scientific experiments that illustrate transportation's harmful effects on the environment.	½-1
52	Students observe noise, air, water, and visual pollution of the environment associated with transportation vehicles and facilities.	1½-3
53	Students create posters depicting the relationship between transportation vehicles and our consumption of natural resources.	1½-2
54	Students solve math problems and compare the fuel efficiency of different transportation vehicles.	1-2
	Mini-unit 14 What can you do to help save your environment?	
55	Students discuss actions which can be taken by individuals who experience adverse environmental effects from transportation vehicles and facilities.	1-2
56	Students discuss when it is appropriate to object to someone's use of transportation when it has detrimental effects on the environment.	1
57	Students identify actions that the government and individuals are taking to reduce transportation's harmful effects on the environment.	1½-2½

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[a] Assumes class period of 30-40 minutes.

TRANSPORTATION AND THE ENVIRONMENT (CONTD.)

Supplementary Activities

Activity #	*Activity Description*	*Class Time*[a] *(periods)*
58	Students discuss the automobile's indirect effects on the environment.	1-1½
59	Students play board game that reviews potential beneficial and harmful consequences of different modes of transportation.	½-1
60	Students engage in one or more mini-activities on transportation's effects on the environment.	½-2
61	Students answer questions on transportation and the environment.	½-1

[a] Assumes class period of 30-40 minutes.

MINI-UNITS AND LEARNING ACTIVITIES

MINI-UNIT 13

THE EFFECTS OF TRANSPORTATION ON THE ENVIRONMENT

This mini-unit introduces students to the following general concepts:

- Transportation
- Environment
- Pollution
- Transportation's beneficial and harmful effects on the environment

The unit begins with students arriving at a definition of "transportation" and "environment," and moves on to a classroom discussion and scientific experiments which illustrate the effects of transportation on the environment. It concludes by having students go out into their own community to discover and observe, first hand, those beneficial and harmful effects discussed and demonstrated in class.

During the unit, students also examine transportation's use of our natural resources and solve math problems dealing with the energy efficiency of different vehicles.

This mini-unit can easily be integrated into a science unit on transportation or the environment. It can also appropriately supplement a social studies unit on the community.

MINI-UNIT 13 LESSON PLAN

The effects of transportation on the environment

Activity #	*Activities*	*Class Time*
49	DESCRIPTION: Students define "transportation" and "environment" and identify the effects of each on the other. OBJECTIVE: By the end of the activity students will be able to list four beneficial effects and a like number of harmful effects of transportation. Students will describe each effect orally or in writing and for each harmful effect will give a solution for its avoidance or elimination.	½-1 period
50	DESCRIPTION: Students analyze songs about transportation's effects on the environment and compose songs of their own. OBJECTIVE: By the end of the activity students will be able to describe orally or in writing three harmful effects of transportation and explain why they are harmful.	1 period
51	DESCRIPTION: Students engage in one or more scientific experiments that illustrate transportation's harmful effects on the environment. OBJECTIVE: By the end of the activity students will be able to describe in detail the exact effects of one or more kinds of transportation pollution on the environment for a given situation.	½-1 period
52 Spirit Master #11	DESCRIPTION: Students observe noise, air, water, and visual pollution of the environment associated with transportation vehicles and facilities. OBJECTIVE: By the end of the activity students will be able to list at least three harmful transportation effects on the environment in their own community and one way each can be reduced.	1½-3 periods

MINI-UNIT 13 LESSON PLAN (CONTD.)

The effects of transportation on the environment

Activity #	*Activities*	*Class Time*
53	DESCRIPTION: Students create posters depicting the relationship between transportation vehicles and our consumption of natural resources. OBJECTIVE: After completing this activity students will be able to identify the natural resource required to power three different vehicles.	1½-2 periods
54	DESCRIPTION: Students solve math problems and compare the fuel efficiency of different transportation vehicles. OBJECTIVE: By the end of the activity, students will be able to determine the fuel efficiency of different transportation vehicles which they are assigned.	1-2 periods

Total Class Time: 6-10 periods.

ACTIVITY #49

Mini-unit Topic: The Effects of Transportation on the Environment

Approximate Class Time: ½-1 period

Capsule Activity Description: Students define "transportation" and "environment" and identify the effects of each on the other.

Objective:

By the end of the activity students will be able to list four beneficial effects and a like number of harmful effects of transportation. Students will describe each effect orally or in writing and for each harmful effect will give a solution for its avoidance or elimination.

Concepts Treated:

- There is interaction between transportation and the environment.
- Transportation vehicles and facilities have both beneficial and harmful effects on the environment.

ACTIVITY

Students define the terms "transportation" and the "environment" to ensure a clear understanding of these terms before embarking on one or more activities or mini-units.

You might begin the discussion by indicating that different people probably have different ideas when they refer to "transportation and the environment" and if the class is to be able to study the field it has to agree on what it is studying.

Ask students for their definition of the words "transportation" and "environment." For example, "transportation" might be defined as the process of moving people and products. It includes the vehicles used for travel and the facilities which make travel possible (e.g., airports, highways, gas stations). "Environment" might be defined as all our physical surroundings. It includes the air we breathe, the water we drink, the noise we hear, the things we feel and see. Transportation vehicles and facilities are part of the environment. They influence the way we live and they are in turn influenced by other parts of the environment.

Once you and your class have arrived at a workable definition of transportation and environment, indicate that transportation has conferred many benefits on society. Ask students to enumerate these benefits. As they are mentioned you can list them on the chalkboard. Some effects that students may not readily think of follow:

1. Making it possible to view and enjoy scenery that would otherwise be inaccessible or accessible only with great difficulty or at great expense
2. Making it possible, through the use of airplanes, to influence and predict the weather
3. Enabling efficient garbage disposal through the use of garbage trucks
4. Increasing the quality and quantity of agricultural products through the use of airplanes which apply seeds, fertilizers, herbicides, insecticides and growth regulators to various crops
5. Assisting fire fighters in controlling and extinguishing forest fires through the use of airplanes and bulldozers
6. Help in monitoring anti-pollution efforts by tracking oil spills on oceans, lakes and rivers and leakages from off-shore wells through the use of airplanes

Then point out that transportation also has harmful effects on the environment. The class proceeds to identify specific examples of how transportation can harm the environment. A guide to such a discussion follows:*

1. Air pollution: sources (cars, trucks, planes, boats) and effects (health, foliage, animals, weather, clothing)
2. Noise pollution: sources (trucks, trains, planes, cars, recreational vehicles) and effects (health, communication, concentration, sleep)
3. Water pollution: sources (boats) and effects (health, animals, plant life)
4. Visual pollution: sources (billboards, signs, gas stations, auto graveyards, junkyards, litter) and effects (accidents, loss of aesthetic appearance of landscape)
5. Energy use: sources (most forms of transportation) and effects (increased pollution, depletion of valuable resources)

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*You might want to consult the Readings at the end of this chapter for additional background information on this topic.

After the students have thoroughly discussed the beneficial and harmful effects of transportation on the environment, as a class discuss the following two points:

1. Do people get accustomed to some of transportation's harmful effects on the environment, like noise pollution and automobile junkyards, and forget that there may be ways of avoiding or eliminating them?

2. In our efforts to reduce the harmful effects of transportation (cutting back on energy consumption, limiting the building of new highways) are we forgetting the advantages modern transportation confers on society?

Variations and Supplementary Activities:

Small groups of students can research different positive or harmful effects of transportation on the environment and report back to the class.

Students can debate with each other or another class the relative merits of a particular form of transportation in terms of its harmful and beneficial consequences to the environment.

ACTIVITY #50

Mini-unit Topic: The Effects of Transportation on the Environment **Approximate Class Time:** 1 period

Capsule Activity Description: Students analyze songs about transportation's effects on the environment and compose songs of their own.

Objective:

By the end of the activity students will be able to describe orally or in writing three harmful effects of transportation and explain why they are harmful.

Concept Treated:

- Transportation has had many harmful effects on the environment.

Materials Needed:

Records or tapes listed below.

ACTIVITY

Collect records, lyrics, or tape recordings of songs involving transportation's effects on the environment. Examples of songs about transportation's harmful effects include

- Cement Octopus (Pete Seeger, "God Bless the Grass," Columbia Records CS9232)
- Where Do the Children Play (Cat Stevens, "Tea for the Tillerman," A&M Records, SPY 280)
- Air (from the album "Hair," RCA LSO-1150)

Play the records or tapes or have the class sing or read the lyrics. The class identifies harmful transportation effects on the environment referred to in the songs and discusses whether they are accurately portrayed. Students then break into small groups and are instructed to choose a common tune, like "Three Blind Mice," and develop lyrics on transportation's effects on the environment to fit the tune. Each group then sings its song to the class and discussion follows on what effects were identified and how accurately they were portrayed. Students should be encouraged to develop songs on beneficial effects on the environment, too, such as insect control, fighting forest fires, viewing scenery, weather control, garbage collection, forest seeding, and crop spraying.

Variation or Supplementary Activity:

If there are instrumentalists (such as guitarists) in the class, they might learn the songs in advance and help teach their classmates.

ACTIVITY #51

Mini-unit Topic: The Effects of Transportation on the Environment **Approximate Class Time:** ½-1 period

Capsule Activity Description: Students engage in one or more scientific experiments that illustrate transportation's harmful effects on the environment.*

Objective:

By the end of the activity students will be able to describe in detail the exact effects of one or more kinds of transportation pollution on the environment for a given situation.

Concept Treated:

- Transportation has various effects on the environment that can be measured.

Materials Needed:

See individual experiments below for materials needed.

ACTIVITY

Students Observe the Effects of Car Exhaust Pollution on Clothing

Materials needed:

Iron

Ironing Board

Nylon stockings

35-mm photoslide holder

Slide projector

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*These science experiments were developed for this activity by Donald Bockler, a science teacher from Belmont, Massachusetts.

Students iron 1½-inch squares of single mesh nylon (from old nylon stockings, not from stretch pantyhose type) in the middle of a Ready-mount 35-mm photoslide holder. Different slides of the same type should be placed in various locations where modes of transportation are common, such as gasoline station garages, busy street corners, residential street corners, bus stations, airports, train depots, a rural countryside. The slides should be labelled with the name of the school, student, location and date. After 10 days of contamination , the slides are brought back into the classroom and projected onto a screen and breaks in the nylon can be counted and compared with an initial count. The slides can be taken back to their pollution sites and allowed to sit for another 10 days, if time allows. Results then may be presented in a table or graph.

Students then discuss the relative deterioration of nylon in the different areas and the role of transportation in creating air pollution.

Variations:

- Slides may be placed directly underneath different cars, buses, etc. for a more specific study of the different modes of transportation.
- Different thin, net materials may be tested.

Students Observe Particulate Pollution from Vehicles

Materials needed:

Petroleum jelly

Microscope slide

Transparent metric ruler

Students coat a thin layer of petroleum jelly on one side of a microscope slide and hang or place the slide in various locations where different modes of transportation are common, such as: gasoline stations, bus/subway stations, train depots, busy street corners, residential street corners, airports, rural countryside, or simply outside of the classroom window or on the roof. After 10 days, the slides are examined under a microscope and the relative numbers of particles per square millimeter or per microscope field are counted and recorded.

Students discuss the roles of automobiles and buses in releasing particulate matter into the air and possible health consequences and cleaning bills.

Students Observe the Effects of Sunlight on Gasoline

Materials needed:

- Ozome/ultra-violet lamp
- Small clear box or cutaway shoe box and cellophane
- Saucer
- Tablespoon
- Gasoline

Place an ozone/ultra-violet lamp inside a small clear box or a cutaway shoe box with a cellophane or plastic top along with a saucer with one tablespoon of gasoline. Turn on the ozone lamp and observe the following petrochemical reaction:

$$O_2 \xrightarrow{\text{Ozone lamp}} O_3 \text{ (ozone)}$$

$$O_3 + \text{Gasoline} \longrightarrow \text{Aerosol smog}$$

Students relate this reaction to the effect of the sun's ultra-violet rays on gasoline from motor vehicles.

Variations

- The ozone lamp may be used to test the effects of ozone on rubber, such as pieces of automobile tire, over time.
- An induction coil producing a continuous spark may be used in place of the ozone lamp in experiments *not* involving flammable gasoline.

Students Determine the Oil-Absorption Abilities of Various Materials

Materials needed:

- Oil
- Water
- One-square-foot trays
- Hay
- Cloth

Newspaper

Paper towels

Sponge

Weighing scales

Students pour oil on top of water in trays of at least one square foot surface area until the surface is just covered. Equal amounts of oil should be poured into equal size trays of water for each separate material to be tested. Students then try to absorb all of the oil using such materials as hay, pieces of cloth sheets, newspaper, paper towels, sponge, and whatever other materials that they can think of. As much material should be added to the tray as is needed to absorb all of the oil. The material is then set aside and weighed to find out how much material was needed to absorb the oil. The weights and relative absorption abilities can then be compared. Results can be discussed in terms of difficulty in removing oil slicks from beaches and shore line left by boats.

Students Compare Noises Produced by Automobiles, Buses, Subways, and Other Transportation Vehicles

Material needed:

Decibel meter

Students directly measure the noise produced by an automobile pulling away from a curb and compare this noise to a bus pulling away from a curb, and a subway pulling away from its stop. The noise can be quantitatively measured using a decibel meter.

Students should discuss the relative amounts of noise produced by each mode of transportation and determine the amount of noise produced per person being transported. For example, if a bus can carry the same number of people as 30 automobiles, cars create the most noise pollution per passenger transported.

Variation:

- Students may record the sounds on tape and analyze them later on equipment in the school, such as an oscilloscope.

ACTIVITY #52

Mini-unit Topic: The Effects of Transportation on the Environment

Approximate Class Time: 1½-3 periods plus out-of-class time

Capsule Activity Description: Students observe noise, air, water, and visual pollution of the environment associated with transportation vehicles and facilities.

Objective:

By the end of the activity students will be able to list at least three harmful transportation effects on the environment in their own community and one way each can be reduced.

Concepts Treated:

- Transportation affects all communities, some more than others.
- There are often reasons why transportation negatively affects some communities more than others.

Materials Needed:

Checklist (Spirit Master #11).

ACTIVITY

Students keep a detailed written list of their observations of transportation's harmful effects on the environment for a given period of time such as one day, two days, or a week. Examples of types of exposures (which you and your students can add to) are

- Loud airplane noise
- Automobile noises due to defective mufflers, accidents, modified or souped-up vehicles, squealing tires, horns
- Unpleasant exhaust smells from buses, trucks, cars
- Oily water due to boat accidents
- Visual unsightliness (billboards, gas stations, parking lots, car graveyards)

A sample pollution checklist appears on Spirit Master #11 which students can use to record their observations.

After collecting their observations, students read results to the class and tabulate the results on a large wall chart. The class then discusses the following issues:

1. Looking at the results of your community observations do you think transportation pollution is very harmful, somewhat harmful, or not harmful at all to the people who live here? Why or why not?
2. What specific consequences would each of the transportation effects mentioned on the pollution checklist have on people's physical and mental health?
3. Are there any ways these harmful effects can be reduced or eliminated? How?
4. Are the effects of transportation different in the city than in the country? Why or why not?

Variation or Supplementary Activity:

Students can write short biographical stories about a friend or classmate which tell about the ways in which transportation affects his or her life and surroundings.

ACTIVITY #53

Mini-unit Topic: The Effects of Transportation on the Environment

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students create posters depicting the relationship between transportation vehicles and our consumption of natural resources.

Objective:

After completing this activity students will be able to identify the natural resource required to power three different vehicles.

Concepts Treated:

- Transportation vehicles are dependent on the energy provided by natural resources, such as oil and coal.
- The world's natural resources are limited.
- There is a need to conserve natural resources.

Materials Needed:

Pictures of transportation vehicles, poster board or large sheets of construction paper, paste.

ACTIVITY

Start by distributing to each student a picture of a vehicle cut from newspapers and magazines. Ask students to tell the class what makes his or her vehicle move. You will probably have to help them develop the facts that gasoline and oil are necessary to power a car, truck, bus, plane, and boat. Subways, trolleys, and trains require electricity.

If you have also distributed pictures of transportation facilities to some students, you will want to develop the concept that construction and maintenance of terminals, highways, and docks also require use of our energy resources. For instance, buildings require heat and electricity; gas and oil are required to operate construction equipment; tar and oil are used to resurface roads.

Ask students if they know where this energy comes from and ask them if our energy sources are limited or unlimited. Ask students to give you their ideas on what a natural resource is.

Correct any misconceptions held by the students and explain how we are dependent on the natural environment to provide the energy needed to make transportation vehicles operate. For instance, electricity requires the use of water and fuel, such as coal, natural gas or oil, whereas gasoline must be processed from crude oil. While it is possible to plant seeds to grow wheat and other food products year after year, it is not possible to plant coal or oil. Once resources such as coal or oil are taken from the natural environment, they are gone forever. While there is enough energy today to operate transportation vehicles and other things which require the use of our natural resources, there may not be sufficient energy supplies in the future. Therefore it is important that we use our energy resources wisely so as to protect future generations.

Ask each student to paste his or her picture on a large sheet of colored paper or poster board, leaving room to draw a box (about 4" square) in an upper corner. In this box, each student will draw or paste a picture of the natural resource(s) required to make the pictured vehicle move. Then ask students to make up appropriate slogans--such as "Save Our Resources"--and tell each to print his or her slogan across the bottom of the poster.

After you have hung posters around the room, discuss with the class recent actions that government, industry, and individual citizens have been taking to conserve energy in the transportation field [e.g., 55 mph speed limit; promoting greater use of public transportation and more efficient use of the automobile (carpooling); and emphasis on smaller cars].

ACTIVITY #54

Mini-unit Topic: The Effects of Transportation on the Environment

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students solve math problems and compare the fuel efficiency of different transportation vehicles.

Objective:

By the end of the activity, students will be able to determine the fuel efficiency of different transportation vehicles which they are assigned.

Concepts Treated:

- Some vehicles are more energy-efficient than others.
- Speed influences the fuel efficiency of transportation vehicles.
- The number of people riding in a vehicle will influence the vehicle's overall fuel efficiency.

ACTIVITY

Begin the activity by asking students to compute math problems dealing with the miles per gallon (mpg) achieved by different vehicles. Examples are provided below. You may wish to vary the questions according to the ability of your students.

- If a car travel 200 miles and uses 10 gallons of gasoline, how many miles can the car travel on one gallon of gas?
- If a car can travel 20 miles on one gallon of gas, how far can it go on 12 gallons of gas?

Ask students to compute the mpg rate of their family car during the next week. At the end of the week, have the students compare the rates obtained by different sized cars.

Lead students into a discussion of the various factors that affect miles per gallon: the size of the vehicle; automatic or manual transmission; the presence of an air conditioner; the type of driving. City driving, with lots of stops and starts, will generally consume more gasoline than highway driving; and higher speeds consume more gasoline than lower speeds.

The chart below gives the miles per gallon (mpg) rate for different sized cars traveling at different speeds.

COMPARATIVE CONSUMPTION RATES*

Miles/hour	*Subcompact*	*Compact*	*Standard*	*Luxury*
30	31.45 mpg	21.33 mpg	20.33 mpg	13.33 mpg
40	35.19	21.33	20.00	19.28
50	33.05	18.94	17.60	16.62
55	31.91	18.17	16.84	14.92
60	30.78	17.40	16.17	14.22
70	22.82	16.36	14.86	12.74

Ask the students to identify the most efficient and least efficient vehicles and speeds. Discuss the importance of the Federal law which mandates a national 55 mph speed limit in order to conserve energy and save money.** Tell students that the Federal government now requires car manufacturers to list on all new cars the mpg obtained in city driving and on the highways. In this way, consumers might be encouraged to buy more fuel-efficient vehicles.

The gas mileage obtained by a motor vehicle is only one measure of energy efficiency. A more important measure is the number of people a vehicle carries per gallon of fuel--passenger miles per gallon of fuel. Ask students to compute the following problem:

> If three people travel in a car which obtains 20 miles per gallon of gas, how many passenger miles does the vehicle obtain per gallon of gas?

The following chart lists the miles per gallon of fuel or equivalent of various transportation vehicles, an assumed passenger load and the passenger miles per gallon of fuel. Have the students with more advanced math skills compute the passenger miles per gallon on their own. Other students may rank the different transportation vehicles in the order of the number of passenger miles per gallon of fuel. In this way, students will be able to identify the most energy efficient modes of transportation. Point out to students that high-capacity vehicles, such as trains and buses, are not only able to carry more passengers per gallon of fuel, but they also help to relieve traffic congestion which contributes heavily to our air pollution problems.

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*"Effects of Speed on Automobile Gasoline Consumption Rates," a Federal Highway Administration mileage study. Copies available on request.

**January 4, 1975 Amendment to the Federal-aid Highway Act of 1974.

ENERGY REQUIREMENTS OF PASSENGER TRANSPORTATION MODES[a]

Vehicle	*Assumed Passenger Loading*	*Vehicle Miles per Gallon of Fuel or Equivalent*	*Passenger Miles per Gallon of Fuel or Equivalent*
Twin-jet commercial aircraft, 500-mile flight[b]	68-106	0.44-0.54	37-47
Rail turbine train[c]	320	0.33	110
Standard-size automobile, urban, maximum load[d]	6	14.40	86
Intercity bus[e]	47	6.00	282
Heavy rail transit (subway) car, peak load[f]	135	4.00	540
Wide-body commercial jet aircraft, 1000-mile flight[b]	256-385	0.14-0.22	54-60
Standard-size automobile, intercity, maximum load[d]	6	18.00	108
Heavy rail transit (subway) car, off-peak load[f]	35	4.00	140
Average commuter automobile[f]	1.4	13.5	19
Intercity passenger train[c]	540-720	0.50	270-360
Transit bus, off-peak load[c]	30	4.10	123
Commuter rail car, diesel powered[b]	125	2.00	250
Transit bus, peak load[g]	75	4.10	307

Sources:

[a] *Transit Fact Book*, 75-76 Edition, American Public Transit Association.
[b] National Aeronautics and Space Administration.
[c] National Railroad Passenger Corporation (Amtrak).
[d] U.S. Department of Transportation, Federal Highway Administration.
[e] U.S. Department of Transportation, Transportation Systems Center.
[f] Commonwealth of Pennsylvania, Department of Transportation.
[g] Cleveland Transit System.

MINI-UNIT 14

WHAT CAN YOU DO TO HELP SAVE YOUR ENVIRONMENT?

Whereas the preceding mini-unit dealt with the effects of transportation on the environment, this mini-unit deals with *actions* students and other citizens can take to reduce those effects which are harmful. The unit focuses specifically on actions people can take both in their own personal behavior and in their relationships with other people--their friends, relatives, and neighbors.

The unit is important to the topic as a whole because just knowing the harmful effects of transportation on the environment is not enough. One must also know how to resolve conflicts between transportation and the environment and put those solutions to use in one's daily life. This unit, therefore, attempts to make students aware of some of these solutions and how citizens can implement them.

The activities in this unit serve not only to broaden student awareness and understanding of the effects of transportation on the environment but also to enhance several language arts skills, such as listening and speaking.

This unit presents the following concepts:

- Some individuals are personally affected by transportation in a harmful way.
- There are actions that citizens can take to alleviate the harmful effects of transportation activities.
- All levels of government have taken action to improve the environment.

MINI-UNIT 14 LESSON PLAN

What can you do to help save your environment?

Activity #	*Activities*	*Class Time*
55	DESCRIPTION: Students discuss actions which can be taken by individuals who experience adverse environmental effects from transportation vehicles and facilities. OBJECTIVE: After completing this activity, students will demonstrate awareness of methods to deal with personal transportation problems. Given a situation, students will describe the most appropriate way to deal with it through a picture or in writing--and explain why it is the most appropriate way.	1-2 periods
56	DESCRIPTION: Students discuss when it is appropriate to object to someone's use of transportation when it has detrimental effects on the environment. OBJECTIVE: After completing the activity, students will demonstrate knowledge of what action to take to change someone else's harmful behavior. Given a situation, students list the steps they would follow to try to change a polluter's behavior.	1 period
57	DESCRIPTION: Students identify actions that the government and individuals are taking to reduce transportation's harmful effects on the environment. OBJECTIVE: By the end of the activity, students will be able to identify three ways individuals and three ways the government are helping to protect the environment.	1½-2½ periods

Total Class
Time: 3½-5½
periods.

ACTIVITY #55

Mini-unit Topic: What Can You Do to Help Save Your Environment?   Approximate Class Time: 1-2 periods

Capsule Activity Description: Students discuss actions which can be taken by individuals who have experienced adverse environmental effects from transportation vehicles or facilities.

Objective:

After completing this activity, students will demonstrate awareness of methods to deal with personal transportation problems. Given a situation, students will describe the most appropriate way to deal with it through a picture or in writing--and explain why it is the most appropriate way.

Concept Treated:

- There are various ways to deal with personal transportation problems.

ACTIVITY

Students write their responses to the scenario and instructions at the end of this activity. Read anonymously some of the remedies recommended by the students. Responses will generally follow two patterns: changing the behavior of the individual(s) responsible for the effect, or taking action to avoid the impact by preventing it from reaching or bothering the person affected. For example, one solution to noises from trucks on the street where one lives is to ban truck traffic from the street. This type of solution forces the party or parties responsible for the problem to eliminate it. A second solution would be for the people affected to move to another part of town. This type of solution removes the aggrieved individual from the problem.

After explaining this distinction, students form small groups to read each other's responses and

1. List all the ways the homeowner could solve his or her problem by escaping or avoiding it

2. Choose the one solution the homeowner should adopt

Each group selects a student to make its recommendation and state the reason for it. After hearing all the recommendations, the class votes for the best one.

Leaving the students in their same groups, distribute a different short scenario (see next page) to each group. Students decide whether the problem should be solved through avoidance or protest, and tell how to do it. In some instances, drastic actions may be necessary, in other cases there may be an acceptable compromise. Groups report conclusions to the class and respond to comments and questions from other students.

Variation or Supplementary Activity:

Students can develop and respond to their own scenarios.

This activity can be conducted as a class, discussing each scenario together.

Scenario

Listen to the following story carefully and answer the question at the end as if you were the person involved.

> You live on Forest Street, a pleasant two-lane, tree-lined street in the suburbs. However, Forest Street connects two main highways, Route 2 and Route 65. As a result, huge trailer trucks drive down the street day and night. The noise is disturbing and makes it difficult for you and your family to sleep. It's not too bad during the day when you're busy or out of the house, but at night it can be unbearable. Last night you were awake all night because of the noise; it seemed as though half of the trucks didn't have a muffler. But while tossing in your bed, you hit on a solution to the problem.
>
> *Write what solution you might have found.*

There are no right or wrong answers, just many different solutions.

Additional Scenarios for Discussion

1. You swim in a lake that has suddenly been invaded by motor boats that make a racket. What's your solution to the problem?

2. The town is going to widen the road in front of your house. There will now be more traffic moving faster which you feel could be hazardous to the children on your street. What's your solution?

3. You live next door to the fire station. At all hours of the day and night, the engines come out with their sirens wailing, waking you up several times during some nights. What's your solution?

4. You live by a stop light. During the day and evening, kids like to stop their cars to abreast at the light and then "peel out" when the light changes, squealing their tires. The noise makes it difficult for you to concentrate, and you are a lawyer who does all her work at home--work that requires great concentration. What's your solution?

5. You live near the airport. The noise of planes taking off and landing every few minutes makes it difficult for you to carry on a conversation with your family and friends. The airport officials have just announced plans to build another runway so they can handle twice as many planes. What's your solution?

6. You live near the airport. Planes taking off deposit soot on your house, laundry, clothing, and car. Even the air you breathe smells awful. What's your solution?

7. You live near the airport and the planes taking off and landing are hurting your ears. You went to a doctor who told you your ears are being damaged by the constant loud noise. What's your solution?

8. You work in the city, and it's not easy to get another job these days. But once or twice a month there is so much pollution in the air that your eyes water and you cough badly. You always seem to get a lot of colds and you are concerned that the pollution may be damaging your lungs. What's your solution?

Supplementary Scenarios *(in which features of the environment interfere with transportation)*

9. You live near an intersection, which you must cross every day going to school, where you've nearly had two serious accidents in the last month because a large oak tree in the park blocks your view of all traffic to the right. What's your solution?

10. You ride your bicycle to school every day past a hamburger stand where there are always soda pop cans on the sidewalk and street, forcing you to weave in and out, to avoid them. Yesterday you ran over one can trying to avoid another one, fell off your bike, and sprained your wrist. What's your solution?

11. You own a restaurant in the suburbs and advertise it in the local newspapers. However, many people get lost trying to find it because of two confusing highway signs. What's your solution?

ACTIVITY #56

Mini-unit Topic: What Can You Do to Help Save Your Environment?

Approximate Class Time: 1 period

Capsule Activity Description: Students discuss when it is appropriate to object to someone's use of transportation when it has detrimental effects on the environment.

Objective:

After completing the activity, students will demonstrate knowledge of what action to take to change someone else's harmful behavior. Given a situation, students list the steps they would follow to try to change a polluter's behavior.

Concept Treated:

- There are actions students can take to positively influence other people's behavior.

ACTIVITY

Divide the class into groups. Give each group a scenario which you have developed or one from those provided at the end of the activity. Groups may be given different scenarios or the same one. Each group reads its scenario and discusses

1. Whether the individual involved has a right to complain to the person who is allegedly polluting the environment

2. If so, what methods for influencing the polluter would be most effective and why

The groups present their conclusions to the class in the form of role plays and respond to any questions or comments you or the class may have concerning their solutions.

After the role plays, the class as a whole compiles a set of guidelines it can follow to successfully deal with the behavior of someone who is harming the environment or making transportation safety difficult.

Sample Scenarios

Your father always empties his car ashtray in the parking lot while waiting for you at school. The car ashtray isn't just full of cigarette butts, either. There are usually empty cigarette packages, gum, and other messy things in it. How can you explain to your father that he is polluting the environment?

Your best friend lives one street behind you, and the easiest and quickest way to get there is to cut through a neighbor's yard on your bike. Today, as usual, you ride your bike through your neighbor's yard and, as usual, she yells. She says you're welcome to cut through her yard, but not on your bicycle. Why does she yell?

Your family lives in the suburbs, and your mother works eight miles away in the city. But she drives into town and back every day rather than take the bus. If she took the bus, she would have to walk three blocks, wait 5-15 minutes for the bus and change buses once on the way. You feel that's not so bad--you do it every weekend when you go into town to the movies. You think your mother is contributing to air pollution, wasting gasoline, and ruining her nerves in the traffic. Do you have the right to tell your mother to take the bus? Why? If you do, what should you tell her?

Mr. and Mrs. Knox have planted two four-foot hemlock trees on the corner of their property. In three years, the trees will be as high as six feet. This bothers you because in three years your children will be old enough to play in the street, and the trees will make it impossible for cars coming around the curve to see them. The Knoxes have planted trees, you think, because they want privacy and enjoy plants. Do you have a right to complain to them? Why? What should you say?

You have joined a carpool at work in an effort to save money and gasoline. Many of the other people in the factory have done the same thing. It really turned out to be fun! You have a chance to chat with other people in the carpool going to and from work which makes driving more interesting than it used to be. But Jim Jones, who works next to you, is still driving his own car 22 miles to work every day. This really bothers you because you're doing your best to save gasoline, and Jim is being very wasteful. And there are at least two other people in the factory who could form a carpool with him. However, Jim continues to drive by himself because he dislikes waiting for someone to pick him up in the morning, waiting for people to get together before he can leave at night, and driving out of his way for other people. Each trip would take about fifteen minutes longer for him in a carpool and he would have to put up with poor driving habits of some of his fellow workers. Do you have the right to complain to Jim? Why? If you do, what can you say to convince him to join a carpool?

ACTIVITY #57

Mini-unit Topic: What Can You Do to Help Save Your Environment?

Approximate Class Time: 1½-2½ periods plus out-of-class time

Capsule Activity Description: Students identify actions that the government and individuals are taking to reduce transportation's harmful effects on the environment.

Objective:

By the end of the activity, students will be able to identify three ways individuals and three ways the government are helping to protect the environment.

Concepts Treated:

- Individuals can take actions to protect the environment.
- Laws and regulations have been passed recently to protect the environment.
- Government at all levels encourages the use of less polluting and more energy-efficient modes of transportation.

ACTIVITY

Ask students what actions their families are taking to help protect the environment. Mention the following specific kinds of environmental protection:

- Energy conservation
- Control of air pollution
- Control of water pollution
- Control of noise pollution
- Control of visual pollution

Students develop lists of actions individuals can take in each of these areas. You may want to supplement their lists with some of the examples provided at the end of the activity.

After students have prepared their lists of personal actions, ask them to prepare additional lists under the same subject headings as those listed above of government actions that protect the environment. Do they know of any programs being sponsored by the local government of their community to protect the environment? Do they know of any laws, local, state, or Federal, that citizens must now obey that are helpful in protecting the environment?

When students have completed all lists, ask them to look for headlines in newspapers for the next four or five days, that tell about personal or government actions to protect the environment. Post all articles on a bulletin board. After one week, have students report to classmates on articles they brought in.

Air Pollution Control

Government Action:

- Since 1970, the Federal government has required car makers to reduce the amount of harmful chemicals which come out of car engines.
- All levels of government have encouraged greater use of public transportation and carpooling which help to reduce the amount of harmful chemicals going into the air.
- The Federal government has taken action to reduce air pollution caused by airplanes.
- Some cities, such as Minneapolis, Minnesota and Madison, Wisconsin, have restricted autos from parts of the downtown area to improve air quality.

How Individuals Can Help:

- Keep cars in good working order. Cars which are not taken care of properly pollute more than cars in good condition.
- Whenever possible, use the mode of travel which causes the least harm to the environment (e.g., walking, bicycling, public transportation, carpooling).

Water Pollution Control

Government Action:

- The Federal government has sponsored research to improve the construction of oil tankers to lessen the possibility of oil spills in case of a collision.

- The Federal government is developing regulations to make the transportation of hazardous materials safer.

How Individuals Can Help:

- Be careful when using boats for recreation.
- Do not throw litter into the water.

Noise Pollution Control

Government Action:

- The Federal government and many state and local governments have passed laws to limit loud noise.
- The Federal government is in the process of establishing noise limits for airplanes.
- Research is being conducted to make transportation vehicles quieter, e.g., loud noise caused by tires of large trucks.
- Highways are now being designed to limit noise.

How Individuals Can Help:

- Keep cars in good working order; faulty mufflers and other car disorders cause more noise than necessary.
- Use horns only when necessary.

Controlling Visual Pollution

Government Action:

- The Federal government has granted money to state and local governments to plant shrubs, trees, and fences along highways.
- Many traffic signs have been standardized to prevent confusion.
- Many billboards have been removed and their use is now regulated.
- Laws now control the location of junkyards.

How Individuals Can Help:

- Report confusing traffic signs and highway signs to proper authorities.
- Use litter baskets. Hold trash until a proper disposal is found.

Energy Conservation

Government Action:

- 55 mph speed limit was imposed to save fuel.
- Car makers must list on all new cars the mpg rating for city and highway driving.
- All levels of government are promoting the use of more energy efficient ways of traveling, especially the use of public transportation and carpooling.
- Efforts are being made to reduce the fuel consumption of airplanes.

How Individuals Can Help:

- Obey the 55 mph speed limit.
- Use public transportation and carpooling as often as possible.
- Walk or ride a bicycle, whenever possible.

SUPPLEMENTARY ACTIVITIES

Activities #58, #59, and #60 which follow can be used either in conjunction with one of the mini-units or individually, by themselves.

Activity #61, the last activity, suggests quiz questions you can use after teaching one or more of the mini-units or individual activities.

ACTIVITY #58

Supplementary Activity Approximate Class Time: 1-1½ periods

Capsule Activity Description: Students discuss the automobile's indirect effects on the environment.

Objective:

By the end of the activity students will be able to list at least three advantages and three disadvantages automobiles have for the environment.

Concepts Treated:

- Many facilities are needed to service and maintain automobiles.
- There are many advantages and disadvantages associated with automobiles and related facilities.

ACTIVITY

In small groups students identify and evaluate the automobile's indirect effects on the environment. Begin the activity by reading aloud to the class the scenario provided at the end of the activity. Then ask each group to

- List all the items or facilities the Minister of Automobiles must have built before cars are allowed into Smogfree
- List all the problems that could possibly result from bringing cars to Smogfree
- List all the advantages that could result from the introduction of cars to this society

After the brainstorming sessions, the students come back together and draw up class lists for the three items listed above. Then raise some or all of the following questions for discussion as a class.

1. How do the facilities on the list help automobile travel?

2. How prevalent or widespread is each of the facilities in your community?

3. How much space do they seem to take up in your community?

4. What positive effects* do these facilities have on the environment? For example, are they interesting or attractive to look at (well designed bridges, aesthetically built highways, tastefully landscaped roads, architecturally appealing gas stations or subway stations)? Do they contribute to the cleanliness or orderliness of the neighborhood? Do they make possible or facilitate travel to parks, historic sites, or other natural environment areas? Do they remove traffic from the city? Do they involve garbage collection or crop spraying?

5. Are any of the facilities unpleasant to look at (automobile junkyards, ugly unclean gas stations, grotesque bridges, monotonous highways)?

6. Do any of the facilities discourage travelers from using less polluting forms of transportation?

7. Do any of the facilities present dangers to the community (injuries to children roaming streets or junkyards, visibility hazards, distractions to drivers)?

8. Are there other important uses the land occupied by these facilities could be put to in your community (parks, playgrounds, housing)?

After the discussion students write or illustrate what they think the result would be of bringing cars to Smogfree.

Smogfree

Imagine that you were flying from London to Australia last year and your plane crashed in the wilderness. You survived the crash and found your way to a large city in some foreign land. You were taken to a hospital, treated, and released. While waiting for the next stagecoach to take you over the mountains, you thought about something you had been struck by the moment you crashed in the country: there were no cars. Everyone traveled around by horseback, bicycle, and foot. You said to yourself, "If I could interest a car dealer in the U.S. to sell cars here, we could make a fortune."

Much later, you were indeed able to persuade a car company to agree to sell small cars to Smogfree, the country you had crashed into. So the company sent you back to Smogfree to persuade the rulers to allow cars to be sold. After many long talks the people of Smogfree finally agreed to let cars be introduced--but on one condition. You had to become Minister of Automobiles in Smogfree and make sure that the country was ready to handle cars before any cars actually arrived.

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*You might want to consult the Readings at the end of this chapter for additional background information on this topic.

The rulers of Smogfree are now giving you a free hand to do whatever needs to be done to get the country prepared for and able to handle a large number of cars. But these rulers have let you know that if the cars create any serious problems, you will be executed. You decide to stay and make your fortune.

You are now sitting down to plan what needs to be built and created in Smogfree to make it easy for the capital city and the rest of the country to accommodate cars.

What do you need to build in Smogfree to handle cars? What problems will cars create that you should plan for now?

ACTIVITY #59

Supplementary Activity Approximate Class Time: ½-1 period

Capsule Activity Description: Students play board game that reviews potential beneficial and harmful environmental consequences of different modes of transportation.

Objective:

After completing this activity students will be able to demonstrate knowledge of the environmental consequences of different modes of transportation. Using at least three modes of transportation, students write a story which centers on either the beneficial or harmful effects of those modes of transportation.

Concept Treated:

- Transportation vehicles have both beneficial and harmful effects on the environment.

Materials needed:

Game boards and game cards (Spirit Masters #12, #13 and #14), dice and playing pieces.

ACTIVITY

Students exercise their knowledge of transportation's effects on the environment by playing a simple board game. Materials required include a small game board (which appears on Spirit Masters #12 and #13), a set of cards for each player (cards appear on Spirit Master #14), a die for each group of players, and individual playing pieces (e.g., eraser, paper clip, pebble, button).

The class breaks into small groups of three students. Each group is given a set of game materials. The first time the game is played, students cut out their own transportation effects cards and paste the game board onto cardboard for durability.* Each group will need a die to determine the number of boxes to move on the board and each player will need a playing piece to move around the board. Instructions for playing the game appear on the game board.

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*A manila folder works well for this. Paste the game board onto the open folder. Close the folder to store the game for later play.

Variation or Supplementary Activity:

Activity can be used as an evaluation of student learnings about transportation's effects on the environment.

Note: Students need to have already studied the basic effects of transportation on the environment prior to playing this game.

ACTIVITY #60

Supplementary Activity   Approximate Class Time: ½-2 periods

Capsule Activity Description: Students engage in one or more mini-activities on transportation's effects on the environment.

Objective:

After completing one or more of these activities, students write and illustrate a "case study" of their community describing the good and bad effects of transportation on the people who live there.

Concept Treated:

- Transportation vehicles have both beneficial and harmful effects on the environment.

Materials Needed:

See individual mini-activities for required materials.

ACTIVITY

Students engage in one or more mini-activities that illustrate transportation's positive and negative effects on the environment and identify the nature of transportation modes and facilities.

1. Pictures of forms of transportation are arranged on a large circular card with a spinner in the center. Students spin the spinner, which should land on one picture, and they tell all they know about the environmental effect that particular form of transportation produces. Students should be reminded that although the public seems to be most aware of air pollution, other types of pollution, such as noise, water, and visual are often caused by transportation. Students should also be reminded to identify beneficial effects transportation has on the environment.

2. Students discuss the difference between transportation effects on the environment found in the city and those found in the country. A chart is made listing differences and similarities. To follow up this discussion, students are provided with pictures (magazine or student-made) of transportation effects on the environment and two boxes labeled

city and country. Students decide where each form of transportation effect pictured would most likely be found.

3. Students, with your help, make a map of the local area, including roads where cars, trucks, motorcycles, taxi cabs, fire engines travel; areas airplanes fly over, as well as an airport if applicable; where trains run; where snowmobiles or boats are used; and where any other appropriate form of transportation operates.

The map is pasted onto an old metal window screen. Students make paper replicas of the forms of transportation used in the areas designated by the map and then attach these replicas to magnets. The forms of transportation are then placed in their proper places on the map, and their movement shown.

4. Students develop a chart listing the positive and negative effects of transportation on the environment. As many forms of transportation as possible should be evaluated. An example of such a list is:

Form of Transportation	*Positive Effect*	*Negative Effect*
Tractor	Preparing ground for planting	Noisy

5. Students choose a mode of transportation to role play. You may wish to supply pictures from which they can choose modes and roles. Classmates are given clues and are then asked to identify the mode. Pantomime can be used instead of role play, the clues being bodily movements.

6. Students create comic strips showing a harmful and beneficial effect of transportation on the environment. An example of such a comic strip is a picture of a bus being driven down a street and emitting a large amount of black smoke. Another example is a picture of a plane spraying crops for insects. The next section shows a student remarking about the bus smoke or crop spraying to another student. The third picture shows students discussing what can be done about the emission problem or how some forms of transportation can help the environment. Comic strips of this nature may be made into a weekly event, as an environmental reminder, or for publication in the school newspaper to promote awareness and discussion.

ACTIVITY #61

Supplementary Activity Approximate Class Time: ½-1 period

Capsule Activity Description: Students answer questions on transportation and the environment.

Objective:
To evaluate what students have learned during their study of transportation and the environment.

ACTIVITY

A series of questions follows on transportation and the environment. You will want to choose only those questions which treat aspects of transportation and the environment which your students have studied.

These quiz questions can be used to evaluate a mini-unit or to supplement the evaluation methods included in the activities.

1. Circle all the vehicles listed below that can cause air pollution.

Car
Airplane
Motor boats
Bicycle
Truck
Canoe

2. List three things that air pollution harms.

(a) ______________

(b) ______________

(c) ______________

3. Water pollution can be caused by motor boats.

True False

4. Water pollution is harmful to the health of humans and animals and hurts plant life.

True False

5. Draw a picture of a town or city that has visual pollution. Label the things that are polluting your picture.

6. Transportation harms every community and every neighborhood. Name one kind of transportation that causes each of the kinds of pollution in the list below.

Air pollution (cars) ____________________

____

____

Noise pollution ____________________

____

____

Water pollution ____________________

____

____

Visual pollution ____________________

____

____

7. List as many transportation facilities as you can--places that service cars or places cars go.

(a) Parking lots

(b) Drive-in movies

(c)

(d)

(e)

(f)

(g)

(h)

(i)

(j)

8. List the advantages and disadvantages of owning a car.

Advantages	*Disadvantages*
(a)	(a)
(b)	(b)
(c)	(c)

9. Your father has been yelling at you a lot lately. He says you use the car too much when you could just as easily walk. You don't see why you should walk when the car sits in the driveway with no one using it. Your father has always said you are one of the best drivers he has ever seen and you always replace the gas you use. He never used to mind that you took the car. Why is he suddenly yelling at you now?

   Is your father right? If he is, what might be a better way of getting you to use the car less other than yelling.

10. List the good and bad effects of the following vehicles.

Vehicle	*Good Effect*	*Bad Effect*
Tractor	Preparing ground for planting	Noisy
Car		
Bus		
Airplane		
Truck		
Motor boat		

11. Transportation is very important to us. We must use it carefully and wisely.

    True   False

Answers

1. Car, airplane, truck, motor boat

2. Man's health

   Foliage

   Weather

   Animals

   Clothing

3. Ture

4. True

5. --

6. Air pollution: trucks, buses, cars, airplanes, motor boats, etc.

   Noise pollution: cars, airplanes, trains, road construction, etc.

   Water pollution: oil, gas and litter from boats

   Visual pollution: litter, billboards, automobile graveyards, construction, etc.

7. Garages

   Carhops

   Shopping centers

   Gas stations

   Car dealers

   Auto body shops

   Bridges

   Tunnels

   Car ferries

8.

	Advantages	*Disadvantages*
(a)	Freedom to go where you want	Uses natural resources
(b)	Recreational	Expensive
(c)	Able to commute long distances to work	Causes a great many deaths because of accidents
(d)	Door to door service	Pollutes the air
(e)	Privacy	

9. --

10.

Vehicle	*Positive Effect*	*Negative Effect*
Car	Go where you want to go	Pollutes the air
Bus	Carries many people inexpensively	Pollutes the air
Airplane	Carries many people and cargo long distances quickly	Noise pollution
Truck	Helps people move	Uses valuable natural resources
Motor boat	Helps people have fun	Water pollution

11. True

READINGS ON TRANSPORTATION AND THE ENVIRONMENT

ENVIRONMENTAL AND HEALTH EFFECTS OF AIR POLLUTION*

The effects of air pollution vary with time and place and person, but few of us can escape these effects altogether. Air pollution can impair health. Dirty air makes eyes water and smart; it stings the throat and upsets breathing. People with chronic lung or heart disease are particularly vulnerable to air pollution. Epidemiological studies indicate that direct relationships exist between prolonged exposure to polluted air and the incidence of emphysema, bronchitis, asthma and lung cancer. Polluted air, sustained and heavy for several days, has caused serious illness and death--especially among infants, the elderly, and people with weakened hearts or lungs.

More obviously, air pollution reduces visibility. It can spoil scenic vistas. It can ground planes and make driving hazardous. Its corrosive qualities cause vast economic losses and contribute to the deterioration of cities. It rots and soils clothes, discolors house paints, and rusts metals. It marks monuments and public buildings and increases housekeeping chores and costs for families and businesses.

Damage from air pollution affects rural areas too. It injures vegetation, stunts the growth of shrubs and flowers, damages crops and trees and causes illness among livestock. To farmers, these costs are direct; to most of us, they come indirectly in the form of higher food bills.

Air pollution threatens the delicate, complex natural systems on which all life depends. Undesirable ecological changes may well be its most dangerous long-range result. Signs of climatic alternations are already appearing, at least on a small scale. In 1969 we poured 281 million tons of pollutants into the air in the United States alone, ignoring the dangers that we might be degrading our environment beyond repair.

Automobile Emissions and Their Control

The automobile is one of the nation's major environmental polluters. By weight, more than half of all of the nation's man-made air pollution can be attributed to the internal combustion engine. In some urban areas, it reaches 85 percent of the total quantity of air pollution. Its exhausts include carbon monoxide, hydrocarbons and nitrogen oxides. The automobile also emits varying amounts of lead abestos and other pollutants, many of which end up in the lungs.

Efforts to reduce the level of auto emissions in this country are proceeding along three fronts. Individuals are being encouraged by public interest organizations to increase their use of less polluting modes of travel--car pools, bicycles, walking, and public transportation--and to maintain their automobiles in optimum emission-reducing condition. At the same time, Congress recognized, in passing the 1970 Clean Air Amendments, that the real problem rests with the internal combustion engine itself. Finally, the various states having major air pollution problems have undertaken a program of controlling emissions from already existing vehicles.

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*This reading has been adapted from *A Citizen's Guide to Clean Air*, the Conservation Foundation, 1717 Massachusetts Ave., N.W., Washington, D.C. 20036 under contract with the U.S. Environmental Protection Agency, Catalog No. 71-187901, January 1972.

The 1970 Clean Air Amendments

This law requires that the Federal Environmental Protection Agency (EPA) set standards for emission of carbon monoxide, hydrocarbons and nitrogen oxides. On June 30, 1971, EPA announced a staged schedule for emission reduction which would ultimately result in the following maximum levels of the three major pollutants:

3.4 grams of carbon monoxide per vehicle mile	(1975)
.41 grams of hydrocarbons per vehicle mile	(1975)
.40 grams of nitrogen oxides per vehicle mile	(1976)

The burden of achieving these standards rests with the automobile manufacturers who may request extensions in the timetable but must ultimately comply with this legislation.

Assuming that the automobile manufacturers do eventually meet standards, how reliable will the emission control devices be? The earlier devices have not proved to be entirely satisfactory. The *Washington Post* reported on August 29, 1971, that

> a seven-city survey of 1,000 privately driven 1970 models, averaging 9,000 mileage, found them exceeding their carbon monoxide ceilings by [illegible]% and their hydrocarbons by 50%. EPA scientists do not know why these 1970s showed such poor results, but theorize that ignition and stalling problems prompted owners to take their cars in for adjustments that distorted the performance of emission controls, which rely on a retarded spark and a clean fuel-air mixture.

The 1970 Clean Air Amendments authorize the agency to test assembly-line models and require the manufacturers to do so also. The Act prohibits manufacturers or dealers from selling noncomplying vehicles and from removing or making inoperable any control device. Penalties for violation of this section are as high as $10,000 for each offense. EPA is required to publish the results of emission tests performed on prototype and assembly-line models of all makes of new cars. Citizens can consult the regional EPA offices to find out when the results are published in the *Federal Register*.

Beginning with 1971 model cars, manufacturers have been required to include in their new car warranties a guarantee that the car complies with applicable emission regulations and that it is free from any defects that would prevent it from complying during its useful life (five years or 50,000 miles). When better tests have been developed to check the performance of the emission control devices, the manufacturers must provide new warranties which require that they replace at their own expense any faulty control device if, during the car's useful life

1. The faulty device was maintained and operated in accordance with the manufacturer's instructions;

2. Failure of the device results in the owner being penalized, including the loss or right to operate the car, fines, and so on.

The law also provides a Federal program for the purchase of special low-emission vehicles for government use, once they are developed. Citizens may decide to urge their state and municipal governments to adopt similar purchase requirements. Once the Federal certification and purchasing program has stimulated the development of such vehicles, state purchases can help expand the market. The city of Boston has already announced its plan to convert all city-owned cars to run on liquified natural gas. Since the costs of fuel and maintenance for this fuel are lower than those for ordinary cars, Boston hopes to recover much of its initial changeover investment while reducing air pollution in the city.

State Responsibilities for Auto Emission Control

Although the 1970 Clean Air Amendments specifically prohibit states (except California) from setting their own emission standards for *new* vehicles they do retain the responsibility of controlling emissions for *existing* vehicles. This poses a number of problems, such as establishing vehicle inspection and enforcement programs, developing other control strategies and ensuring the availability of alternative modes of transportation.

Auto emission standards are only as good as their enforcement, and enforcement may be almost impossible without a practical, reliable inspection system. Many states are contemplating adding an emission inspection to their automobile safety inspection, but several factors should be considered before such a decision is advocated by citizen groups. One of these is the lack of simple and reliable testing equipment and procedures which produce replicable results. Several practical and reportedly accurate testing systems are under development, but they may prove expensive. Expense itself is another factor. Will the benefits of an inspection program outweigh the cost of establishing and maintaining it? The initial investment for a statewide system can easily run into millions of dollars, and the results of a few experimental programs have been disappointing. It is often difficult to get proper repairs for cars that have failed the test. Once the control device is adjusted, it may only remain that way for a couple of months. Emission control devices do curtail vehicle performance, especially in acceleration and idling. Thus, a third problem is the tendency of many motorists to adjust their cars properly only to pass the test, and then readjust them to operate more satisfactorily.

Another problem to be considered is the operational difficulties of administering a state-wide inspection program in states having varying amounts of air pollution, depending on the distribution of population, the distances between urban centers and meteorological conditions. Sparsely populated states may find the costs of operating such a system prohibitive. Finally, the heaviest burden of a vehicle inspection system may well fall on low-income car owners who often drive the older and less-cared-for problem cars and generally have poor access to public transportation to much needed jobs, schools and shopping.

There are alternatives to vehicle inspection systems which show promise for effective reduction of air pollution. These methods focus on reducing the total number of miles driven by all cars in a heavily polluted area, instead of on the emissions of an individual vehicle. These control strategies include reduction of highway construction, restriction on driving in certain downtown areas, incentives to car poolers, taxes on mileage or on gasoline, express busways along existing freeways, and the development and support of high quality public transportation in urban areas. They are generally part of a state's "implementation plan"--that plan required under the 1970 Clean Air Amendments for the "implementation, maintenance and enforcement" of any air quality standard set forth by EPA.

Before advocating either an emission inspection program or alternative control strategies, citizens may want to do further research on the advantages and problems of each. One place to start is with two studies done for EPA by the Institute of Public Administration. These are Governmental Approaches to Air Pollution Control and Governmental Approaches to Automobile Air Pollution Control. Both studies present interesting discussions of the economic and administrative dimensions of different control strategies.

The Citizen's Role

In addition to curtailing the pollution from their own vehicles, citizens have several other responsibilities with respect to controlling automobile pollution. The first of these is being informed. The 1970 Clean Air Amendments recognize the right of citizens to know what the air quality situation is in their respective regions. States are thus required to gather emission data from individual sources, correlate them with the standards, and make this information available to the public. Citizens in some states may want to press their state agencies to make such reports available in local libraries or other accessible locations.

Even more important is attendance at and participation in public hearings. The Clean Air Amendments of 1970 declare that public hearings must be held in each state before it adopts an implementation plan and sends it to EPA for approval. Each state must

1. Provide at least 30 days' notice of a hearing through prominent advertisement of the hearing's date, time and place;

2. Make available for public inspection, in at least one location in each control region, the principal portions of the proposed implementation plan for that region;

3. Make available for inspection all rules and regulations proposed for inclusion in the plan; and

4. Keep hearing records that will contain, at a minimum, the list of those testifying, together with the text of each presentation.

Citizens may want to press state officials to hold a public hearing in their locale, even though technically only one is required in the state. Attendance of large numbers of people at hearings who support strong plans and testify to this effect, however briefly, will help counter the arguments of those who claim that environmental concern is a passing fancy. This testimony will help to build a good hearing record which is important in EPA's consideration of whether or not to approve the plan. Also, if there are any legal challenges to the plan, the court will base its decision, in part, on the hearing record.

Finally, the 1970 Amendments specifically recognize the right of citizens to bring suit against any violator of standards or other requirements of the Act. Any "person" may sue another "person" for failure to enforce or comply as required. "Person" is defined as "an individual, corporation, partnership, association, State, municipality, or political subdivision of a State." There are two limitations to this right: no one may sue EPA for an action not specifically required under the Act, and no one may sue his own state, except under certain circumstances. The Act authorizes any court to award any costs of litigation, including expert witness fees and reasonable attorney fees, to any party to a suit, as the court thinks appropriate. Although this provision removes one of the common deterrents to litigation by private citizens--expense--court action can still be very difficult and time consuming, and may not always be the most effective way to proceed. A good attorney should be consulted on the desirability of taking this kind of action.

HIGHWAY BEAUTIFICATION ACT OF 1965*

Title II of the Highway Beautification Act provides for the control of junkyards which are within 1,000 feet of the nearest edge of the right-of-way and visible from the traveled way of the interstate and Federal-aid system.

The act also provides reimbursements to the states, the District of Columbia, and Puerto Rico for 75 percent of eligible landscaping and screening costs and for 75 percent of the cost of just compensation for the relocation, removal or disposal of those junkards which cannot as a practical matter be screened.

The law further stipulates that the states must enact legislation to control future junkyard locations through licensing and zoning, and thereby avoid the expense of bringing new facilities into compliance.

Junkyards located in industrially zoned areas or in unzoned industrial areas of similar character are exempt from control under the Federal law.

Failure by the states to comply with the provisions of the Highway Beautification Act could subject them to a penalty of a 10 percent reduction of their annual Federal-aid highway funds.

To determine the extent of the problems adjacent to the Interstate and Federal-aid primary systems, all 50 states, the District of Columbia, and Puerto Rico have made a detailed inventory of all junkyards adjacent to these systems as of October 22, 1965. The inventories show that approximately 80 percent of the junkyards can be concealed from the main traveled way by natural objects, plantings, fences, or other means. The remaining 20 percent must be relocated, removed, or otherwise disposed of.

Each location to be screened must be treated individually to meet the specific condition. It is not the intent to conceal a place of active business but merely to soften the visual impact of the exposed junk. The screening should extend beyond and blend with the immediate area. The following general types of screening warrant consideration.

1. Highway border plantings of trees, shrubs, etc., of a size and density that will largely impair view across the right-of-way line.

2. Earth mounds graded and rounded to a reasonably natural appearance and planted with grass or nonmowing ground cover.

3. Open wire, chain link, wood, or other fences covered with vines to provide the effective screen.

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*This reading has been adapted from *Junk and Control: Highway Beautification Act of 1965.* U.S. Department of Transportation, Federal Highway Administration, 1967.

4. Open wire, chain link, wood, or other fences with inserted light metal, wood, or plastic strips to provide the screen cover.

5. Solid or semisolid fences such as board, picket, or sapling wood types; metal with lightweight panels, expanded mesh, and other commercially available types (100 percent screen at all angles of view is not considered essential): or other available materials such as fiber glass or asbestos board panels.

6. Walls, preferably pierced or open type, of stone, brick, concrete block, or some combination of materials in keeping with the general area, limited to practical heights.

7. Combinations of the above.

When planting alone is used, it is more desirable and economical to provide an open screen effect. Glance views of junkyards at normal highway speeds are not objectionable. A solid screen may be unnatural and inappropriate in relation to the adjacent roadside vegetation and development. Plants should be of varieties comparable to those which exist in the area. Fully mature trees should rarely be used as they may have a low survival rate. Plants should be of a variety that will grow relatively fast so that effective screening is attained within a 2- to 5-year period. In many instances, planting may be accomplished within the presently owned State right-of-way. Where this cannot be accomplished, it will be necessary to arrange with the owner to screen the junkyard on his property.

BENEFICIAL EFFECTS OF HIGHWAYS ON THE ENVIRONMENT*

Well, are we paving the country?

Far from it. All roads, including city and suburban streets, occupy less than one per cent of the land area in the United States. Federal studies in nearly 50 larger cities show that the percentage of land occupied by roads in developed areas is declining. The land is being used for larger lots, more open spaces, landscaped areas. Overall, even with the growth of new arterial highways and expressways, roads take up no greater percentage of the nation's urban areas than they did before the auto was invented.

But aren't we still building a lot of new highways?

Not as many as it would seem. The great bulk of our work, carried out by the New York State Department of Transportation and other transportation agencies throughout the nation, is being done on or near existing roads. Only a small part of our total highway construction mileage involves building roads through totally new areas.

Well, then, why are we spending so much on highway work?

Roads become worn out and outmoded. We have more people, more vehicles and, most importantly, more usage of these vehicles all the time. A highway built in the 1920s or 1930s in a rural area may well be a congested, dangerous route today, bordered by mushrooming residential or commercial development. Such a road, and there are many of them, should be replaced with a safe highway built for today's traffic demands and the demands of the future.

The interstate highway system now coming into being throughout the nation is adding 42,500 miles of new expressways. This is only a bit more than one per cent of the nation's road and street mileage, but it will carry more than 20 percent of the travel. This means freeing older roads of congestion, making all highways easier to travel and safer. In New York State, with all but 15 percent of its 1,350 miles of interstate highways in service, these new highways are removing traffic pressures in both rural and urban areas, saving time and money for highway users. Most of all, they are saving lives. Federal officials report that a life is saved each year for every five miles of new interstate highway placed in service. For New York State, that means 230 lives a year being saved now and 270 lives when the system is completed.

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*This reading consists of excerpts from "Are we Paving the Country?" distributed by the State of New York Department of Transportation and "Benefits of Interstate Highways," distributed by the U.S. Government Printing Office.

Couldn't a lot of this highway travel be accomplished by public transportation?

It can be and is, in the large cities. Elsewhere, the private passenger car is the workhorse of passenger transit, accounting for 98 percent of the intercity travel. In most cities, public transit means buses--and they need highways too. Even in the metropolitan areas, cars are needed to get to airports, train and subway stations, bus stops. The fact is that the private car gives a freedom of mobility and wide open schedule for travel that makes it the most used mode of transportation by far.

Large-scale technological improvements such as the interstate highway system often result in profound and sometimes irreversible changes in the natural and manmade environment. Interstate highways can play a vital role in protecting and enhancing the desirable elements of the physical environment, for example, by increasing opportunities for people to enjoy the beauty and uniqueness of the environment, through greater accessibility. Independent alignment of dual lane interstate highways improve erosion control, restriction of billboard advertising, and selective tree trimming, all contribute toward increasing opportunities for enjoyment of the environment while protecting its ecological structure. Also, highway agencies frequently develop or assist in programs to protect environmental features of scenic, historical, educational, recreational, symbolic, or ecological significance. For example, a number of states have used interstate construction to create recreational lakes from excavations for highway construction, rest areas utilizing Indian mounds, dinosaur tracks, or other historic or natural features.

Interstate highways can have a significant beneficial impact in reducing air and noise pollution in urban areas. Interstate highways, often constructed to bypass downtown areas, reduce unnecessary travel through downtown areas where existing noise and air pollution levels are high. Also, interstate highways eliminate considerable pollution and noise effects of stop-and-go traffic on city streets. The following (from the *American Roadbuilder,* January 1969) shows the dramatic improvements expressways can make in reducing automobile carbon monoxide emissions.

Type of Traffic Situation	*Pounds of Carbon Monoxide per Vehicle Mile*
Expressways	0.11
Arterial streets	.22
Local streets	.27
Central business district	.42

The primary reason for this very significant difference in carbon monoxide emissions is that the amount of unburned gasoline increases sharply when an engine is accelerated or decelerated. For example, when an automobile is cruising less than 2 percent of the total fuel supplied to the engine is emitted unburned through the exhaust pipe. During deceleration, this increases dramatically to 18 percent. Average speed also plays an important role. A change in speed from 20 mph to 30 mph yields a one-third reduction in total emissions. Air pollution emissions are at a minimum when vehicles are traveling at a relatively constant speed such as on interstate highways. Similarly, interstate highways reduce the more disturbing peak noise levels created by trucks and other noisy vehicles by reducing the need for acceleration and deceleration generally characteristic of travel on neighborhood streets.

Recent advances in the design of interstate highways not only make them more esthetically appealing, minimize neighborhood social and economic disruption, but are also beneficial in terms of reducing air and noise pollution levels. For example, a modern, well designed, elevated structure is visually pleasing, does not inhibit mobility and reduces noise levels in nearby areas. Depressed areas also reduce noise levels. Some interstate highways are now being designed with exclusive bus lanes which will reduce air and noise pollution by decreasing the number of autos and by providing free-flowing bus traffic. Interstate highways help reduce air pollution levels in urban areas by another indirect way. The relationship between interstate highway improvements and industrial decentralization is well known. Both the benefits and hardships of the movement of industry from the center city have been well documented. Evidence is mounting that urban air pollution problems are caused not only by the presence of such things as smoke stacks and automobiles, but by the overall spatial and temporal arrangement of these urban elements--in short by urban form.

USE OF AIRCRAFT TO HELP THE ENVIRONMENT*

Many of the positive effects aircraft have on the environment take place in relatively unpopulated areas, thereby escaping notice of the public in general. Occasionally, headlines may highlight some spectacular happening, involving aircraft, but the day-in, day-out operations take place with little fanfare. These routine aircraft operations affect the environment beneficially in the following ways.

Agriculture

Airplanes and helicopters apply seeds, fertilizers, herbicides, insecticides and growth regulators to various crops. Aircraft are able to give better coverage to the crops and can accomplish the work more quickly and effectively than ground operated equipment. In addition, many farmers are utilizing aircraft for planning and checking on farming operations.

Today practically all rice is sown from the air, along with barley, wheat, alfalfa, ladino clover and many other small-seeded plants. Tomatoes are dusted when fields are wet, before worms can cause damage. Weeds, such as blue mustard, can be controlled. This weed can reduce wheat yield by 20 bushels per acre through the existence of only nine weed plants per square foot. During and after spring rains, aircraft can make these applications without destroying newly sprouted crops or becoming mired in the mud which would entrap ground vehicles.

Even better quality, more reasonably priced clothing, can result from agricultural spraying. The boll weevil, scourge of the cotton planter in the early 20th century, has been all but eliminated through aerial application of pesticides. Defoliating agents applied to cotton plants prior to picking allow mechanical harvesters to pick bolls relatively free of leaves and other extraneous plant material. The absence of these impurities allows fewer processing actions, longer staple length, and, ultimately, a better product.

Livestock Production

The airplane has long been one of the livestock producer's handiest tools. Inventory and control of herds is now regularly accomplished from the sky, covering in a matter of hours what would have taken days or weeks by horseback.

When winter blizzards howl across the plains, piling deep snow drifts and cutting herds off from food supplies, aircraft lift hay and grain to stranded animals. Aside from the aversion of economic loss to the rancher, cattle are saved for market, thereby assuring more plentiful and less costly beef to the consumer.

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*Adapted from *Aircraft and the Environment*, Federal Aviation Administration.

Forest Management

In 1971, the U.S. Forest Service flew a total of 96,539 hours; 75,984 in fixed-wing aircraft, and 20,555 in helicopters. Of this total, 73,897 were flown in fire control activities, 5014 in timber management, and 3581 in engineering work with the balance for miscellaneous activities. In addition to government activities, private timber companies utilize aircraft extensively for management of their reserves.

Firefighting Activities

As indicated by the aforementioned statistics, forest fire control activities utilize the largest percentage of aircraft hours flown. In 1971, the Forest Service fought 2812 forest fires with the help of aircraft. Aircraft enable rapid investigation of the extent of fires and provide a picture of the best access to and means of fighting a fire once one starts. Aircraft provide a rapid method of fire-fighting by dumping borate or water, versus having ground-based fire fighters drive to the area with the attendant time delay in ground transportation. The Canadian "scooper duper" amphibian fire bomber can drop 252 tons of water in 5 hours. Helicopters are used to transport personnel to the fire area, permitting fighting of the fire while it is still in the early stages and often preventing its spread. When helicopters are unavailable or unsuitable, airplanes often carry "smoke jumpers"--specially trained parachutists who can quickly get into otherwise inaccessible areas. Aerial observation of a fire in progress enables a rapid and accurate method of directing ground personnel in their fire fighting efforts.

By saving millions of acres of valuable timber from the devastating effects of fire, a more plentiful supply of lumber is available for home building and other purposes.

Forest Seeding and Fertilizing

After trees have been cut from a forest area, sound management practices dictate a reforestation effort in order to preclude erosion and to establish a new stand of timber for future harvesting. Hand planting of seedlings is effective, but time-consuming and costly. Aircraft, dropping pine, fir or other evergreen seeds, can cover cut-over areas in a matter of minutes. Although many seeds do not germinate, experience has proven that enough will to do an effective replanting job. Once seeds have been sown, fertilizers are applied from the air to promote rooting and plant growth.

Insect/disease Control of Forest Areas

Trees, like other living plant life, are susceptible to infestation by borers, insects, fungus and other damage-causing bodies. Plant diseases, like human diseases, can assume epidemic proportions and can wipe out large forest areas if not brought quickly under control. Such diseased forest areas are quickly detectable from the air through the use of techniques such as infrared photography and other sophisticated methodology. Once detected, forests can be sprayed by aircraft to eliminate disease threats.

Selective Logging Practices

Normal logging practices often cause great devastation to forest areas. Numberous roads must be cut to allow access to logging trucks, bulldozers and other heavy equipment. Areas are clean cut to allow easy retrieval of marketable timber. The results are often scarred and eroded hillsides, unsightly piles and brush and felled trees too small to be of value, and destruction of natural wildlife cover. Although still in the developmental stages, aircraft have shown the potential to change this.

Helicopters, and in a few instances, aerial balloons, are being used to lift logs from cutting areas to a central collection point. This eliminates the need for roads and allows selective cuttings of only marketable trees. It also allows previously inaccessible areas to be selectively logged without destroying their surroundings.

Game Management

Aircraft add a great deal of flexibility in the area of game management. More accurate inventories are possible from the air. Animals can be tagged, studied and redistributed to more provident areas through the use of aircraft. In wintry weather, where starvation becomes a real threat, hay and other foodstuffs can be air-dropped at strategic locations. And, to the delight of the avid angler, remote lakes are stocked with fish.

Weather Control

Present weather experimentation, such as cloud seeding by aircraft, will undoubtedly some day allow man to more effectively control his environment. Already man can produce rain in some dry areas with some degree of assuredness. Experiments with fog dispersal are also underway. Through the use of high-flying aircraft, man can also effectively monitor such things as radiation levels, particulate matter, and upper-air moisture content. Aircraft constantly penetrate hurricanes and thunderstorms to learn more of the destructive effects of nature. Through increased knowledge, man will be able to save untold suffering and property damage now inflicted by natural forces.

Energy Related

The rising demand for more energy; electricity, gas, oil, and coal by the American public will undoubtedly require more transmission lines to move it from its source to its ultimate consumer, e.g., the controversial Alaska pipeline. Helicopters are already extensively used for transporting and erecting towers and transmission lines and pipeline components in remote areas. Aside from being more economically effective, helicopters allow construction techniques which do minimal damage to the environment.

Once these lines are installed and in operation, aircraft regularly patrol them to inspect for damage or leakage. Quick detection by aircraft of oil leaks, for example, and subsequent movement of repair crews by helicopter would prevent any substantial environmental damage.

Insect Control

Disease-carrying insects, such as the malarial mosquito, once took a large toll in human suffering. By teaming the airplane with effective insecticides, most such threats have been either eliminated or kept in check. The recent ban on widespread usage of DDT as a control agent sent currents of alarm throughout the world. Undoubtedly, other agents will be developed, but without the airplane to apply them, the agents would lose much of their effectiveness since areas such as swamps are virtually inaccessible to other means of transportation.

Efficiency as a People-mover

Aircraft produce fewer pollutants per passenger mile than any other form of motorized transportation we enjoy today, with the exception of rail travel.

As an example of relative pollution intensities, we might compare a New York City to Chicago trip by a B-727 aircraft carrying 100 passengers with a trip by auto carrying 4 passengers. The total amount of emissions is 12.8 pounds per auto passenger compared with 1.9 pounds per aircraft passenger. Economies of scale with the wide-bodied jets reduce this figure even lower.

If the 183,000,000 passengers enplaned by the domestic airlines for 1972 were forced to utilize conventional motor vehicles as an alternative, the increased number of vehicles required and the resultant pollution levels would cause considerably more pollution.

Pollution Spotters

Aircraft today are continuously monitoring antipollution efforts. Oil spills on oceans, lakes and rivers and leakages from off-shore wells can be effectively tracked and control efforts directed from aircraft. Pollution sources in rivers and creeks can be traced from the air, especially when water or surface travel is hindered by rapids, private property rights, and other obstacles. Aircraft also routinely monitor compliance with air pollution standards.

THE EFFECT OF NOISE ON MAN AND THE NATURAL ENVIRONMENT*

It is generally agreed that noise has adverse effects, residents of areas near airports and freeways need no convincing. If we are to restore our peace and quiet we must have sufficient understanding of the effects of noise to direct us to suitable action. This reading describes the effects of noise on man and on the natural environment.

Noise-induced Hearing Loss

How much noise can the human ear tolerate? Attempts have been made to answer this question for continuous noise exposure in work environments. The problem of estimating critical noise levels for transportation noise is more difficult because of its irregularities, for example, airplane departures and landings. The main impact of transportation noise on personal well-being may be its aggravation of a hearing impairment already induced by the noisy work environment. Consider, for example, an individual exposed to high noise levels at work, traveling to and from work, and at home trying to relax or sleep. This endless exposure to noise may hasten the onset of serious hearing losses, nerve damage and poor health.

It is presently an extremely difficult task to specify the allowable exposure for brief and intense (ten seconds) transportation noise exposures. A maximum tolerable limit for the unprotected ear can be set at 120-135 dB. Current data on transportation noise levels suggests that *by themselves* these irregular transportation systems maintain constant high levels of noise (85-90 dB(A) and up for 8 hours per day), then there exists a serious risk of hearing impairment.

Nervous System Responses to Noise

Noise can cause the body to activate its defense system, the autonomic nervous system, which controls many critical bodily processes (heart output, hormone control, digestion). Noise is responded to as a stress, and the more stresses bearing on man at any given time, the quicker the bodily defenses can be overwhelmed. The specific effects noise has been shown to have on man, depending on its intensity and duration, include an increase in muscular tension, sweating, metabolic changes, reduced gastrointestinal activity, nausea, headaches, tinnitus, drowsiness, respiratory irregularities and emotional disturbances. Although these effects are signs of autonomic arousal, this is *not* necessarily dangerous to the organism unless the arousal is maintained for prolonged periods of time causing depletion of bodily defenses.

Sleep Disturbance

One of the chief complaints about transportation noise is its disturbance of sleep and relaxation. The major offender is the airplane, owing

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*The reading has been adapted from *Transportation Noise Pollution: Control and Abatement*--edited by David O. Dickerson, 1970. Summer Faculty Fellowship Program in Engineering Systems Design, ASEE-NASA Langley Research Center, Old Dominion University Research Foundation.

to its loudness and unexpectedness. Disturbance of sleep is of primary importance because of its necessity for normal psychological and physiological functioning. Aggravated sleep loss has a profound effect on body health, particularly for the aged and the sick, and can become a significant factor in personal well-being. Testimony before a state legislative committee on jet noise in New York cited paranoid delusions, hallucinations, suicidal and homicidal impulses as some of the possible consequences of continuous sleep loss.

The levels of noise that sleepers can tolerate vary widely. A mother is awakened by her baby's cries while the father sleeps peacefully. A dripping faucet can prevent sleep. A jet transport screeches overhead and startles the sleeper awake. Although it is not obvious what characteristics are shared by these sounds, certain fundamental rules can be set forth:

- The louder the noise, the greater the disturbance of sleep
- The more meaningful the sound, the greater the chance of disturbance
- The more unexpected the noise, the greater the chance of being awakened
- The greater the presence of certain personality traits, i.e., neuroticism, the greater the sensitivity to noise
- The younger the child, the greater the susceptibility to interference from aircraft noise
- The greater the age or poorer the health, the lower the resistance to noise disturbance

Psychological Effects of Noise

Noise can have a deleterious effect on man's day to day existence. There is no reported research on the psychological effects of transportation noise, but there are some inconsistent findings on noise in the work environment. A large portion of the research concludes that noise causes a significant increase in work errors and the quantity of work produced. The same applies to students in school. Other studies conclude that individuals with high levels of anxiety perform better under noisy conditions than under quiet ones. Most of the research agrees that the psychological effects of noise vary with the quality of the sound--its duration, direction, frequency and unexpectedness.

Effects of Transportation Noise on the Natural Environment

Noise seems to accompany man wherever he goes. Outdoor recreation has become more and more mechanized and more and more noisy. The burgeoning popularity of trail bikes and snowmobiles has taken man into the quiet forest and mountains in a very intrusive and noisy manner.

The noise of snowmobiles terrifies wildlife already immobilized by deep snow and in a weakened condition. The exertion of fleeing through deep snow is harmful and can be fatal. Low flying aircraft also constitute a source of terrifying noise which affects wildlife and farm animals.

THE AIRPORT NOISE PROBLEM*

The major cause of noise complaint in the last 15 years is the noise around airports. Community responses to airport noise are in some ways unique but in others resemble complaints about any noise irritation.

Studies of relations between aircraft noise exposure and annoyance have helped determine major acoustical and sociological factors affecting annoyance. Annoyance in general results from interference with normal living activities from the noise itself and from vibrations it causes in structures. Activities commonly disrupted include TV and radio enjoyment, rest and sleep, conversation, reading or concentrating, eating and working.

Disturbances can be more insidious and subtle than we may recognize. In one survey a totally deaf man, using sign language, indicated he was unable to sleep because aircraft caused vibrations which shook the house and bed. Residents near major airports have indicated alterations in social relations due to noise. Speech interference has led to friction and hostility among family members and sometimes deterioration of interfamily relationships.

Some of the more important sociopsychological factors known to affect strongly the annoyance produced by a given aircraft noise intrusion include

1. Fear of aircraft crashing
2. General attitude about noise
3. General attitude about residential environment
4. Beliefs about the preventability of aircraft noise
5. Belief in the importance and value of airports and air traffic
6. Belief in the possible effects of noise on health

These factors can be as important as the noise exposure itself in determining annoyance reactions. Thus an individual's reaction to noise seems to be only a part of a more general adjustment to the local environment.

Research suggests that the actions of people sufficiently annoyed with aircraft noise vary from complaining to officials to attempting to abate the effects of noise by keeping windows shut, sleeping with earplugs, and insulating homes. These individual responses mold into community efforts as noise levels and exposure times increase and as it becomes clear that the failure of individual remedies makes a community wide or political solution necessary.

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*The reading has been adapted from *Transportation Noise Pollution: Control and Abatement*--edited by David O. Dickerson, 1970. Summer Faculty Fellowship Program in Engineering Systems Design, ASEE-NASA Langley Research Center, Old Dominion University Research Foundation.

Community reaction to airport noise may be conveniently depicted as a chain of possible events:

EXPOSURE → ANNOYANCE → COMPLAINT → PROTEST

There is no evidence that the people who complain or protest noise are extra-sensitive to that noise, but they do tend to be more convinced that the noise could be prevented and that it affects their health.

THE NOISE CONTROL ACT OF 1972*

Background Legislation

Recognition that noise is an environmental problem that affects people other than workers has been late in coming. Federal noise legislation first appeared in 1968 when Congress directed the Federal Aviation Administration (FAA) to establish rules and regulations to control aircraft noise.

At the state and local level, laws tended to treat noise as a public nuisance, and enforcement was both difficult and spotty. More recently some jurisdictions, notably California and Chicago and New York City, have established new laws and ordinances that are based on noise generating characteristics of specific equipment and, hence, are easier to enforce.

The Clean Air Amendments of 1970 called for the establishment of an Office of Noise Abatement and Control in the U.S. Environmental Protection Agency (EPA). The legislation also called for public hearings of environmental noise and a special report to the Congress on the problem, incorporating the results of the public hearings and other special studies. Information from this EPA report as well as extensive Congressional hearings formed the basis of the Noise Control Act of 1972.

The Noise Control Act of 1972

The Noise Control Act of 1972 represents the first major Federal attempt to eliminate excess noise at the design stage of a wide variety of new consumer products.

Major Provisions

The EPA is directed to develop and publish information on the limits of noise required for protecting public health and welfare as well as a series of reports to identify products that are major sources of noise and to give information on the techniques for controlling noise from such products.

Using the criteria thus developed, the EPA Administrator is required to set noise-emission standards for products that have been identified as major sources of noise and for which standards are deemed feasible. The law requires such standards to be set for products in the categories of *construction equipment, transportation equipment* (except aircraft), *all motors and engines, and electrical and electronic equipment*. It also grants authority to set for other products, standards deemed feasible and necessary to protect public health and safety.

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*Taken from the *Noise Control Act of 1972; Highlights*. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

EPA has authority to require the labeling of domestic or imported consumer products as to their noise-generating characteristics or their effectiveness in reducing noise-generating characteristics or their effectiveness in reducing noise. Manufacturers or importers of non-conforming or mislabeled products are subject to fines of up to $25,000 per day for each violation and to imprisonment for up to one year. Manufacturers must issue warrants that their regulated products comply with Federal standards at the time of sale. They are also required to maintain records and provide information, including production samples, if requested by EPA.

The EPA Administrator also is to prescribe noise-emission standards for the operation of *equipment* and *facilities* of *interstate railroads, trucks,* and *buses.*

All Federal agencies are directed to use the full extent of their authority to insure that purchasing and operating procedures conform to the intent of the law. EPA may certify low-noise emission products for purchase by the Federal government.

Aircraft Noise

Under the Noise Control Act of 1972, the EPA Administrator is required by mid-1973 to make a comprehensive study of aircraft noise and cumulative noise exposure around airports. Using this information, EPA is to submit to the FAA proposed regulations to control aircraft noise and sonic booms. After a hearing and further consultation with EPA, the FAA may adopt or modify the proposed regulations. The FAA may reject the proposals if it believes they are unsafe, technologically or economically infeasible, or not applicable to certain aircraft. However, it must publicly explain its specific reasons for rejection. A continuing review and consultation role is provided for EPA.

An End to Noise Pollution

This comprehensive nature of the Noise Control Act of 1972 brings under Federal regulation for the first time, nearly all of the major new sources of noise. An incentive now exists for the full employment of noise-control technology that is already available, and the day when quiet is restored appears closer. We know how to build quieter. Now the law is to give the nation the stimulation to do it.

TRANSPORTATION AND ENERGY CONSERVATION*

Transportation is a high-energy function. Approximately 60 percent of the liquid fuel consumed in the United States is used for transportation purposes.

Within the transportation sector, highway vehicles are the major consumer, accounting for nearly 40 percent of all the petroleum used in the United States.

1974 GASOLINE CONSUMPTION

Vehicles		*Barrels/day*
Passenger cars		
Getting to work		1,760,000
Pleasure driving		1,360,000
Personal business		1,020,000
Business, government		800,000
	Subtotal	4,940,000
Trucks		1,470,000
Farm vehicles		200,000
Other uses		200,000
	Total	6,810,000

Transportation's petroleum requirements *doubled* between 1954 and 1974.

Ninety-two percent of the more than 2.4 trillion "person miles" of travel annually in the United States are by automobile.

Seventy percent of all travel in the United States is by automobile; 27.6 percent by commercial air transportation; 1.5 percent by bus, and 0.5 percent by passenger rail.

Motor vehicles, therefore, are of paramount significance in U.S. fuel conservation efforts, because they are the predominant users.

In 1970 oil imports cost the United States $2.7 billion. In 1974 the U.S. paid *$23.6 billion* for the oil needed to bridge the difference between domestic production and nationwide demand.

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*This reading has been adapted from a U.S. Department of Transportation Fact Sheet of June 10, 1975.

From the days of oil surpluses in the 1960's, the United States has moved to a dependency situation. In 1974 imports were needed to supply 37 percent of our petroleum needs; unless conservation, energy conversion, and energy efficiency efforts succeed, U.S. dependency on foreign oil could rise to 50 percent by 1980.

While estimates of undiscovered oil reserves vary greatly, the known recoverable reserves of U.S. oil are reported to be 45 billion barrels. In view of contemporary consumption rates, limited reserves, and declining domestic production, petroleum independence is not attainable as a short-term goal.

Fuel conservation is essential for economic as well as for supply reasons. The motor vehicle, as the major user (about 45 percent of the petroleum used annually in the U.S.), is potentially the greatest saver--especially in view of the vast quantities of fuel wasted through carelessness, inefficiency, unnecessary driving, and driving at higher speeds than necessary.

How the 55 mph Speed Limit Saves Fuel

The nation's 105 million automobiles, 26 million trucks, and 400,000 buses consume about 75 percent of the petroleum used for transportation purposes in the United States, nearly 107 billion gallons in 1974.

The government has challenged the auto industry to achieve a 40 percent improvement in fuel efficiency by 1979, to an average passenger car performance of nearly 20 miles per gallon.

Tests by the Federal Highway Administration* show improvements in automobile fuel economy ranging from 11.8 to 28.5 percent by driving at 55 mph rather than 70 mph, depending on the size of the car.

COMPARATIVE CONSUMPTION RATES

Miles/hour	*Subcompact*	*Compact*	*Standard*	*Luxury*
30	31.45 mpg	21.33 mpg	20.33 mpg	18.33 mpg
40	35.19	21.33	20.00	19.28
50	33.05	18.94	17.50	15.62
55	31.91	18.17	16.84	14.92
60	30.78	17.40	16.17	14.22
70	22.82	15.36	14.86	12.74

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*"Effects of Speed on Automobile Gasoline Consumption Rates," a Federal Highway Administration mileage study. Copies available on request from the FHWA, Washington, D.C. 20590, Attention: HPA-1.

About half of all vehicle miles are driven under conditions where speeds above 55 mph are possible. The potential savings if 90 percent of the driving population comply with the 55 mph speed limit are estimated at 200,000 barrels of gasoline per day--20 percent of the total savings advocated by President Ford for 1975.

Average interstate speeds declined 7.5 mph in 1974. Surveys show that only 6 percent of highway vehicles exceeded 65 mph in 1974, compared to 31 percent in 1973. An important part of the 3.4 percent reduction in gasoline consumption in 1974 was due to lower speeds.

BIBLIOGRAPHY

BIBLIOGRAPHY

The Bibliography contains educational materials for classroom use and for use by teachers in developing relevant units of study on transportation and the environment. It consists of selected:

- Materials for teachers
- Periodicals

The individual entries in the materials for teachers section are presented in the following format:

** *Title of Work,* author, date of publication. Number of pages or list of materials. Price.

Type of Material Description of material with evaluation of material's quality and relevance for transportation consumer education.

Source from which material may be obtained.*

For purposes of convenience, the teacher materials have been rated by the designation of stars next to the material description. (See sample above.) The stars represent the authors' evaluation based on the following scale:

No stars:	material is useful, but fair
(*) One star:	material is good
(**) Two stars:	material is very good
(***) Three stars:	material is excellent

It should be kept in mind that these evaluations are an estimation of the material's *quality and relevance.*** As such, the absence of a teaching material or a low rating does not *per se* indicate the material is poor. It may be excellent, but simply not relevant to the Manual's content. In addition, any absences may be due to the authors' oversight.

At the end of the Manual is a list of government agencies which can be contacted for futher information about transportation and the environment.

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*Allow ten weeks for delivery of items ordered from the U.S. Government Printing Office.

**A complete discussion of the criteria used to evaluate the materials may be found at the end of the Manual.

Elementary Level Consumer Education, 1972. 77 pages. $2.00.

Guide Overview of Consumer Education at the elementary school level, with capsule descriptions of several programs in operation and of different teaching methods used. Extremely useful for its discussion of teaching methods, including field trips, classroom discussions, students teaching students, and use of newspapers. Guide also provides a series of methods for handling tough teaching problems like shoplifting and student embarrassment about being on Welfare.

Consumers Union on the U.S., Inc.
Educational Services Division
256 Washington Street
Mt. Vernon, New York 10550

* *Park and Recreational Facilities: Their Consideration as an Environmental Factor Influencing the Location and Design of a Highway,* 1971. 47 pages. 45¢.

Pamphlet Informative discussion of what criteria should be considered when building a highway to protect playgrounds, parks, and parkways.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Transportation Noise and its Control, 1972. 27 pages. 70¢.

Pamphlet Informative, not too technical, discussion of the nature of noise pollution, the decibel unit of measurement, the extent of noise caused by cars, trucks, planes, and rapid transit and possibilities for reducing or eliminating transportation noises.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 50000-0057

** *Automotive Fuels and Air Pollution,* 1971. 32 pages. 40¢.

Pamphlet Detailed account, for the layman, of automobile pollutants, their effects, and what can be done to eliminate or reduce them.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

** *Aircraft and the Environment,* 1973. 13 pages. Free.

Pamphlet Detailed description of the positive effects airplanes have on the environment, from crop spraying to fire fighting. Indispensable supplement to other accounts of airplanes' harmful effects on the environment.

Federal Aviation Administration
Aviation Education Programs Division A6A 300
Office of General Aviation Affairs
Washington, D.C. 20591

* *Cost of Air Pollution Damage: A Status Report,* 1973. 73 pages. $2.50.

Pamphlet A review of studies on the cost of air pollution damage on human health, vegetation, materials, and residential property values. Transportation pollution is not singled out. Very analytical.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Stock Number PB-222 040

** *Readings for the Eco-Activist,* 1972. 41 pages. Price not listed.

Bibliography A bibliography of environmental publications of the Federal government for young persons interested in involvement in environmental problems. There are chapters on air, water, and noise pollution that include materials on transportation pollution.

Division of Information Services
Office of Library Services
U.S. Department of the Interior
Washington, D.C. 20240

** *Health Effects of Environmental Pollution,* 1973. 20 pages. 30¢.

Pamphlet Highly useful overview of the effects of air, water, and noise pollution on human health.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

* *Needed: Clean Air; the Facts about Air Pollution,* 1972. 15 pages. 25¢.

Pamphlet

Useful but very sketchy overview of the effects of air pollution on health, energy depletion, and economic costs. Transportation is included as one of the sources of pollution.

Channing L. Bete Co., Inc.
45 Federal Street
Greenfield, Massachusetts 01301

* *Vanishing Air,* by John C. Esposito, 1970. 328 pages. 95¢, paperback.

Book

Highly critical account of government's attempt to regulate air pollution and industry's alleged attempts to avoid self-regulation. Chapter 1 on general causes and effects of air pollution and section of Chapter 6 on air pollution from airplanes are relevant and informative. Major attention is paid to automobile pollution; author blames the government for not enforcing strict standards and the industry for not taking actions of its own and attempting to avoid Federal and state controls.

Grossman Publishers
125A East Nineteenth Street
New York, New York 10003

* *Air Pollution: The World's Exhaust,* 1971. 62 pages. $1.00.

Book

Overview of the air pollution problem, with discussions of smog, what air pollution is, automobile pollution, health effects, effects on the weather, and who should be responsible for preventing air pollution. Approach is to raise questions rather than present solutions.

Pendulum Press, Inc.
The Academic Building
Saw Mill Road
West Haven, Connecticut 06516

A Congregation of Vapors, 1973. 35¢.

Flyer

Six-page summary of the nature and effects of air pollution and some of the problems associated with controlling it. (Not evaluated)

League of Women Voters
1730 M Street, N.W.
Washington, D.C. 20036

Air Pollution Primer, 1969. Price varies.

Flyer Handbook that explains air pollution's processes, sources, characteristics, and effects. Special sections on weather and radioactivity.

Available from local
Tuberculosis Association

* *Railroads and the Environment in Rail Freight Operations,* 1972. 28 pages. 30¢.

Pamphlet Concise, informative discussion of railroad pollution and abatement, including odors, engine exhaust emissions, sanitary waste control, noise, and land use. Photographs.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

* *Noise Pollution,* 1972. 13 pages. 35¢.

Pamphlet Informative discussion of what sound is, how it affects our health, and general ideas for solutions. Noises from transportation pollution sources are discussed.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 5500-0072

* *Noise and You,* 1970. 15 pages. 25¢.

Pamphlet Brief overview of the nature of noise and the dangers of too much and too loud noise. Not tied in specifically with transportation noise.

Channing L. Bete Co., Inc.
45 Federal Street
Greenfield, Massachusetts 03101

The Freeway in the City, 1968. 141 pages. $3.00.

Book Somewhat technical discussion of the principles of urban freeway planning and design that considers environmental concerns in terms of the view from the freeway, location of the freeway, and highway structures. Well illustrated.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

** *The Accessible City,* by Wilfred Owen. 150 pages. $2.95.

Paperback

General discussion of big city transportation problems, with emphasis on rational planning to avoid problems. Chapter on public transport provides useful background information on one alternative to the automobile. Sections on transportation planning consider concerns about land use and esthetics.

The Brookings Institute
1775 Massachusetts Avenue, N.W.
Washington, D.C. 20036

** *Highways and Our Environment,* by John Robinson, 1971. 332 pages. $24.00.

Book

Well-written, highly informative, and impassioned account of how highways and the automobiles they serve have blighted the environment with litter, concrete, air and noise pollution, and visual unsightliness. Chapters on Citizen Action and the Highway Establishment are very useful. One Appendix lists citizen action groups and government agencies involved in transportation and the environment. A profusion of valuable photographs makes the work unique.

McGraw-Hill Book Company
1221 Avenue of the Americas
New York, New York 10020

** *Unsafe at Any Speed,* by Ralph Nader, revised edition, 1972. 367 pages. $1.95.

Paperback

New edition of now classic study of car industry's lack of attention to safety. Chapter 4, "The Power to Pollute," attributes the failure to control automobile pollution to industry delays, collusion, and miserliness. Book as a whole is indispensable for this view toward responsibility for pollution and efforts to control it, even though most of the book is about automobile safety.

Bantam Books, Inc.
666 Fifth Avenue
New York, New York 10022

* *Rethinking Your Automobile,* 1973. 6 pages. Free.

Flyer

Brief discussion of consumer's role in reducing use of cars in view of the energy shortage.

Office of Public Affairs
U.S. Environmental Protection Agency
Waterside Mall
Washington, D.C. 20460

*** *Getting Around: People and the City,* 1974. 48 pages. $1.29.

Pamphlet Informative, thought-provoking case studies and discussions on urban transportation, including commuting, rapid transit, citizen action, dial-a-bus, mass transit, banning cars, and the Bay Area Rapid Transit (BART) in San Francisco. Discussion questions are provided. Well illustrated; photographs.

Scott, Foresman and Company
1900 Eastlake Street
Glenview, Illinois 60025

Superhighway--Superhoax, by Helen Leavitt, 1970. 95¢.

Paperback A polemic with facts about Federal highway programs, funding, and operations; cites problems and issues in localities throughout the U.S.; special chapter on urban highway problems; information on alternative transit systems.

Ballantine Books, Inc.
201 East 50th Street
New York, New York 10022

Governmental Approaches to Automobile Air Pollution Control, 1971. $3.00.

Pamphlet Discusses industry's control of auto emissions, consumer control, and advantages and disadvantages of standard-setting and traffic system designs.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Publication No. PB203-952

Dead End: The Automobile in Mass Transportation, 1972. 231 pages. $1.45.

Paperback Comprehensive discussion of role of automobile in contemporary American life and detrimental effects it has had. Included are discussions of the energy problem, air pollution, freeways, and alternatives to the automobile.

Penguin Books Inc.
7110 Ambassador Road
Baltimore, Maryland 21207

* *A Citizen's Guide to Clean Air,* 1972. 95 pages. Free.

Pamphlet An extremely useful, detailed account of the clean air laws and how citizens can advocate and plan for the control of air pollution. One chapter deals with auto emission controls, another with the citizen's legal rights, and a third with the citizen's role in policy-making.

The Conservation Foundation
1717 Massachusetts Avenue, N.W.
Washington, D.C. 20036

** *The Campaign for Cleaner Air,* by Marvin Zeldin, 1973. 28 pages. 35¢.

Pamphlet Informative, factual account on clean air, including the Clean Air Act, implementing the law, controlling automobile pollution, and the citizen's role.

Public Affairs Pamphlets
381 Park Avenue South
New York, New York 10016
Pamphlet No. 494

** *Don't Leave It All to the Experts: The Citizen's Role in Environmental Decision Making,* 1972. 19 pages. Free.

Pamphlet Identification of methods by which citizens can protect the environment, including becoming informed, knowing the law, lobbying, fighting for funds, and knowing your rights.

Office of Public Affairs
U.S. Environmental Protection Agency
Waterside Mall
Washington, D.C. 20460

*** *Rites of Way: The Politics of Transportation in Boston and the U.S. City,* by Alan Lupo, Frank Colcord, and Edmund P. Fowler, 1971. 294 pages. $3.95.

Paperback Detailed account of how community opposition in metropolitan Boston forced the state and local governments and quasi-independent commissions to abandon plans to construct freeways in and around the city. Book also discusses who makes transportation decisions in other major U.S. cities and the politics of such decisions. Excellent example of citizen action seeking to alter the environmental effects of transportation decisions on population displacement, traffic congestion, land use, and esthetics.

Little, Brown and Company
34 Beacon Street
Boston, Massachusetts

** *Ecotactics: A Sierra Club Handbook for Environment Activists,* 1970. 287 pages. 95¢.

Paper-back

Informative essays on the nature of several different aspects of the environmental crisis, including transportation's effects on the environment. Especially useful for descriptions of methods by which citizens can individually and collectively work to reduce pollution. Many readers, however, will find some of the tactics beyond their ability, energy, or interest, and inappropriate on ethical grounds. Many tactics described with reference to industrial pollution are equally applicable to pollution caused by transportation. Appendices list books, environmental groups and societies, and key Federal agencies of relevance to activists.

Periodicals

Periodicals are a rich source of information on transportation and the environment and on the availability and location of additional relevant materials. Even general transportation or environmental periodicals contain in many issues articles of relevance. It was impossible, however, to provide here a list of useful articles that have appeared in the recent past in periodicals. Moreover, the subscriber or reader cannot know in advance when a periodical will print an article that will interest him. Despite these drawbacks, many teachers will find it useful to subscribe to or read library copies of periodicals in the expectation that they will discover articles or references to additional materials of immediate relevance to their teaching or research efforts. The more specifically a periodical is related to his or her particular interest, of course, the more likely is the reader to find relevant materials. Teachers and readers can also consult in libraries the *Reader's Guide to Periodical Literature* for past articles about transportation and the environment.

Bicycling!
119 Paul Drive, Box 3330
San Rafael, California 94903

Bike World
P.O. Box 336
2536 Middlefield Road
Mountain View, California 94040

Changing Times
The Kiplinger Magazine
Editors Park, Maryland 20782

Consumer News
Office of Consumer Affairs, Department of Health, Education and Welfare
Superintendent of Documents
U.S. GPO
Washington, D.C. 20402

Consumer Reports
Consumer's Union
256 Washington Street
Mt. Vernon, New York 10550

Environment Action Bulletin
33 East Minor Street
Emmaus, Pennsylvania

Newsletter of the American Council on Consumer Interests
238 Stanley Hall
University of Missouri
Columbia, Missouri 65201

Of Consuming Interest
Federal State Reports
P.O. Box 986
Arlington, Virginia 22216
(703) 527-4950

Transpo Topics for Consumers
Department of Transportation
Office of the Secretary
Washington, D.C. 20590

BIBLIOGRAPHY EVALUATION CRITERIA

All teacher and student materials that were located were evaluated along two dimensions: *quality and relevance.* Quality was defined to include the following components:

- Provision of creative and detailed classroom activities or learning experiences that go beyond the one or two sentence "have the students do *x, y, z*" suggestions
- Development of decision-making skills that may be transferable to other consumer issues
- Attention to affective educational approaches and objectives, not merely cognitive ones
- Emphasis on student initiative and involvement in classroom activities and in the planning of those activities
- Concentration on student concerns
- Clear presentation that allows teachers to develop additional activities and units of their own
- A modular, flexible approach that enables teachers to develop activities and units tailored to the needs of their particular students and community
- Provision of accurate factual information
- A nonmoralistic, noninjunctive approach
- Stress on the needs and problems of minority groups
- An interdisciplinary approach to consumer education

Few curriculum materials combined all these quality ingredients. Many included none or only a few. In some borderline cases where a teaching material contained some quality ingredients, the authors made a subjective evaluation on whether the material contained enough of these elements to warrant referencing in the Manual.

To be considered relevant, a teaching material had to deal in a significant way with transportation from the point of view of or useful to a consumer. Teaching materials were excluded from the Manual when their relevance was extremely limited or nonexistent because

- Only a small section of the material dealt with transportation issues. However, such materials were included when a subsection was of high caliber, dealt with an important aspect of transportation and the environment not covered elsewhere, or was part of an easily accessible and inexpensive unit.

- The material was extremely specific--it dealt with too narrow an aspect of an issue to be useful to teachers or students except in highly specialized courses or units.
- The material was designed for a highly specialized audience.
- The material was oriented strictly toward career education.
- The material was outdated.
- The material contained information that applied primarily or significantly to a local situation.
- The material was not distributed out of state.

GOVERNMENT INFORMATION AGENCIES

For further information about transportation issues, contact the appropriate U.S. Department of Transportation or other government agencies listed below:

Agency Name and Address	*Telephone Number*
U.S. Department of Transportation 400 7th and D Streets, S.W. Washington, D.C. 20590	202-426-4321
Office of the Secretary of Transportation Office of Consumer Affairs (address above)	202-426-4520
National Highway Traffic Safety Administration Consumer and Public Affairs (address above)	202-426-0670
Federal Highway Administration Public Affairs (address above)	202-426-0648
United States Coast Guard Public Affairs (address above)	202-426-1587
Urban Mass Transportation Administration Public Affairs (address above)	202-426-4043
Federal Railroad Administration Public Affairs (address above)	202-426-0881
Federal Aviation Administration Public Affairs 800 Independence Avenue, S.W. Washington, D.C. 20591	202-426-3883
Interstate Commerce Commission Constitution Avenue and 12 St., N.W. Washington, D.C. 20432	202-343-4761
Federal Trade Commission Bureau of Consumer Protection Pennsylvania Avenue and 6th St., N.W. Washington, D.C. 20580	202-962-2358

Agency Name and Address	*Telephone Number*
Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460	202-755-0890
Civil Aeronautics Board Office of the Consumer Advocate Washington, D.C. 20428	202-382-7735

SPIRIT MASTER #1: FOR USE WITH ACTIVITY #1

Bicycle Poll

Name:

Age:

1. Do you own a bicycle?

   Yes ____ No ____

2. Do you ride a bicycle?

   Yes ____ No ____

3. If you ride a bicycle, how often do you ride it? (Fill in the *number* of times you ride.)

   __________ times each month

4. For what reasons do you use your bicycle? (Check all you agree with)

   Recreation and fun ____
   Exercise ____
   Running errands ____
   Commuting to work ____
   Having fun with friends ____

   Fill in any other reasons you use your bicycle.

   ____

   ____

   ____

5. What are the advantages of owning or riding a bicycle?

   It is faster than walking. ____
   It can be parked very close to your destination. ____
   It saves energy. ____
   It does not pollute the air. ____
   It is fun. ____
   It is good exercise. ____

   Fill in any other advantages.

   ____

   ____

   ____

6. What are the disadvantages of owning or riding a bicycle?

   It can be unsafe. ____
   It can't be easily ridden in bad weather. ____
   It can't carry very much besides the rider. ____
   You need to be rather healthy to ride it. ____
   It can be easily stolen. ____
   It cannot take you long distances quickly. ____

   Fill in any other disadvantages.

   ____

   ____

   ____

7. If there were more places to ride your bicycle would you use it more often?

   Yes ____ No ____

SPIRIT MASTER #2: FOR USE WITH ACTIVITY #10

Bicycle Poll

This is a poll on what kinds of things you have done on a bicycle. Do not sign you name.

1. Are you a boy or girl (circle one)?

   Boy　　Girl

2. Have you ever ridden a bicycle (circle one)?

   Yes　　No

3. If so, about how many times did you ride it in the last year (circle one)?

   1　　5　　Too many times to remember

4. Have you ever ridden sidesaddle or on the handlebars of someone else's bike (circle one)?

   Yes　　No

5. Have you ever had someone ride sidesaddle or on the handlebars of a bike you were riding (circle one)?

   Yes　　No

6. If you own a bicycle, does it have a light (circle one)?

   Yes　　No

7. Have you ever ridden a bicycle at night without lights (circle one)?

   Yes　　No

8. Do you usually ride in the same direction the cars are going or facing the cars (circle one)?

   Same direction　　Facing the cars

9. Do you stop for red lights (circle one)?

   Never　　Sometimes　　Always

10. Do you stop for stop signs (circle one)?

    Never　　Sometimes　　Always

11. When you ride in the street or on the sidewalk with a friend, do you ride in front of him or her, behind, or next to (circle one)?

    In front of　　Behind　　Next to

12. When you ride, do you usually ride with one or both hands on your bike (circle one)?

    One hand　　Both hands

13. When you make a turn on your bike, do you signal which way you are going to turn (circle one)?

    Yes　　No

14. Have you ever been in a bike accident where you were hurt (circle one)?

    Never　　Once　　A couple of times　　Many times

15. If you have been in a bike accident, what caused it (circle one)?

    Riding too fast
    Hit by a car
    Hit by another bicycle
    Didn't stop for a red light or stop sign
    Riding in the middle of the street
    Some other reason (say which one)

    ____

BICYCLE SKILL PROGRESS RECORD

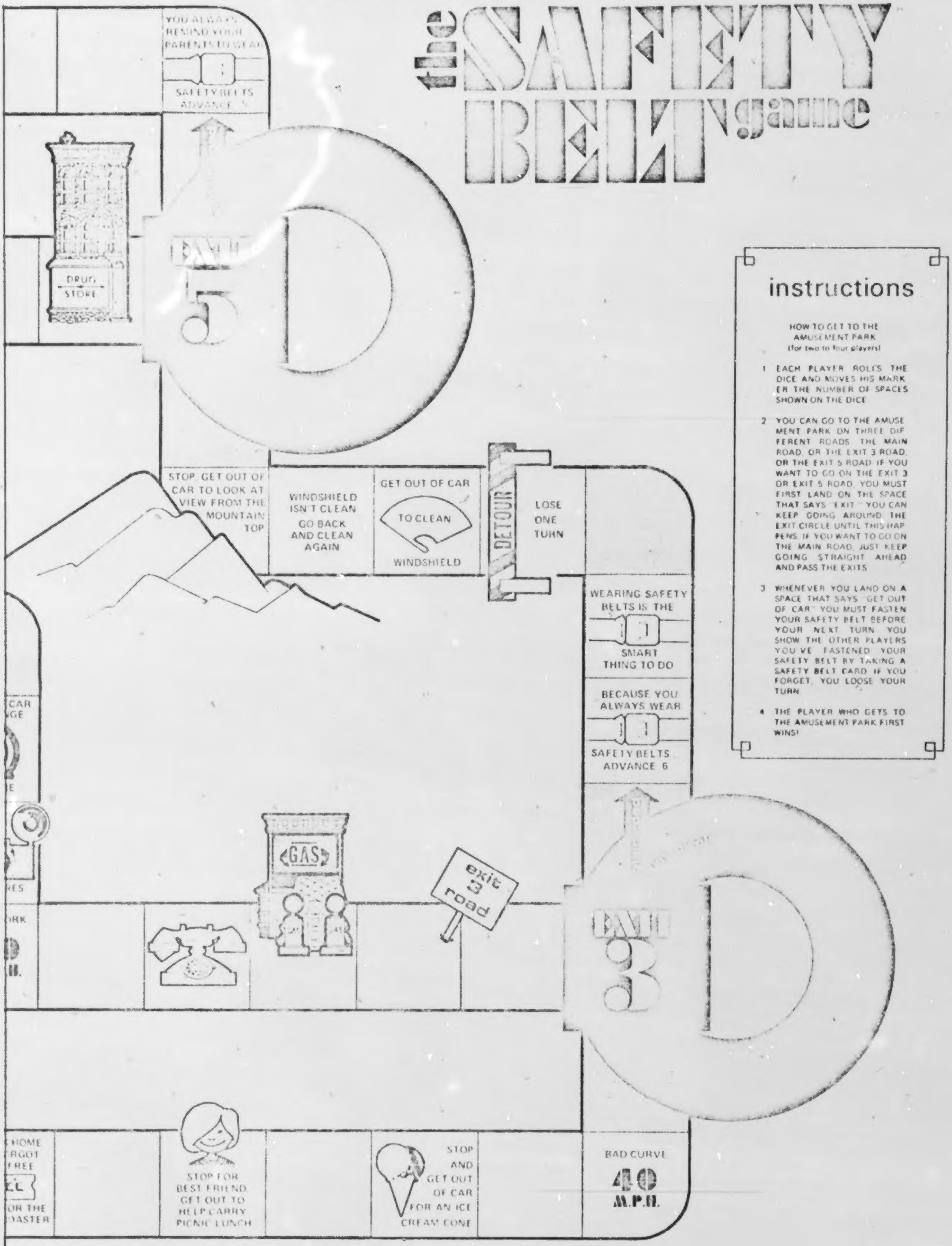
NAME______________________

Score each activity as indicated on each exercise description. Record only those scores that show a definite improvement and give the date of improvement.

Exercise	*Score*	*Date*	*Score*	*Date*	*Score*	*Date*	*Score*	*Date*	*Score*	*Date*
Balance ability	____min ____sec		____min ____sec		____min ____sec		____min ____sec		____min ____sec	
Speed coordination	____feet		____feet		____feet		____feet		____feet	
Decreasing serpentine	____pylons		____pylons		____pylons		____pylons		____pylons	
Slow speed coordination	____feet		____feet		____feet		____feet		____feet	
Decreasing space	____obstacles		____obstacles		____obstacles		____obstacles		____obstacles	
Right or left evasion	____feet		____feet		____feet		____feet		____feet	
Left spiral	____ring ____o'clock		____ring ____o'clock		____ring ____o'clock		____ring ____o'clock		____ring ____o'clock	
Right spiral	____ring ____o'clock		____ring ____o'clock		____ring ____o'clock		____ring ____o'clock		____ring ____o'clock	

SPIRIT MASTER #3: FOR USE WITH ACTIVITY #13

SPIRIT MASTER #4: FOR USE WITH ACTIVITY #19


the SAFETY BELT game
YOU ALWAYS REMIND YOUR PARENTS TO WEAR SAFETY BELTS ADVANCE 5
DRUG STORE
EXIT 5
STOP. GET OUT OF CAR TO LOOK AT VIEW FROM THE MOUNTAIN TOP
WINDSHIELD ISN'T CLEAN GO BACK AND CLEAN AGAIN
GET OUT OF CAR TO CLEAN WINDSHIELD
DETOUR
LOSE ONE TURN
WEARING SAFETY BELTS IS THE SMART THING TO DO
BECAUSE YOU ALWAYS WEAR SAFETY BELTS ADVANCE 6
CAR
GE
E
3
RES
RK
H.
GAS
exit 3 road
EXIT 3
HOME
RGOT
FREE
OR THE
OASTER
STOP FOR BEST FRIEND GET OUT TO HELP CARRY PICNIC LUNCH
STOP AND GET OUT OF CAR FOR AN ICE CREAM CONE
BAD CURVE 40 M.P.H.

instructions

HOW TO GET TO THE AMUSEMENT PARK
(for two to four players)

1 EACH PLAYER ROLES THE DICE AND MOVES HIS MARKER THE NUMBER OF SPACES SHOWN ON THE DICE

2 YOU CAN GO TO THE AMUSEMENT PARK ON THREE DIFFERENT ROADS THE MAIN ROAD, OR THE EXIT 3 ROAD, OR THE EXIT 5 ROAD IF YOU WANT TO GO ON THE EXIT 3 OR EXIT 5 ROAD, YOU MUST FIRST LAND ON THE SPACE THAT SAYS "EXIT" YOU CAN KEEP GOING AROUND THE EXIT CIRCLE UNTIL THIS HAPPENS IF YOU WANT TO GO ON THE MAIN ROAD, JUST KEEP GOING STRAIGHT AHEAD AND PASS THE EXITS

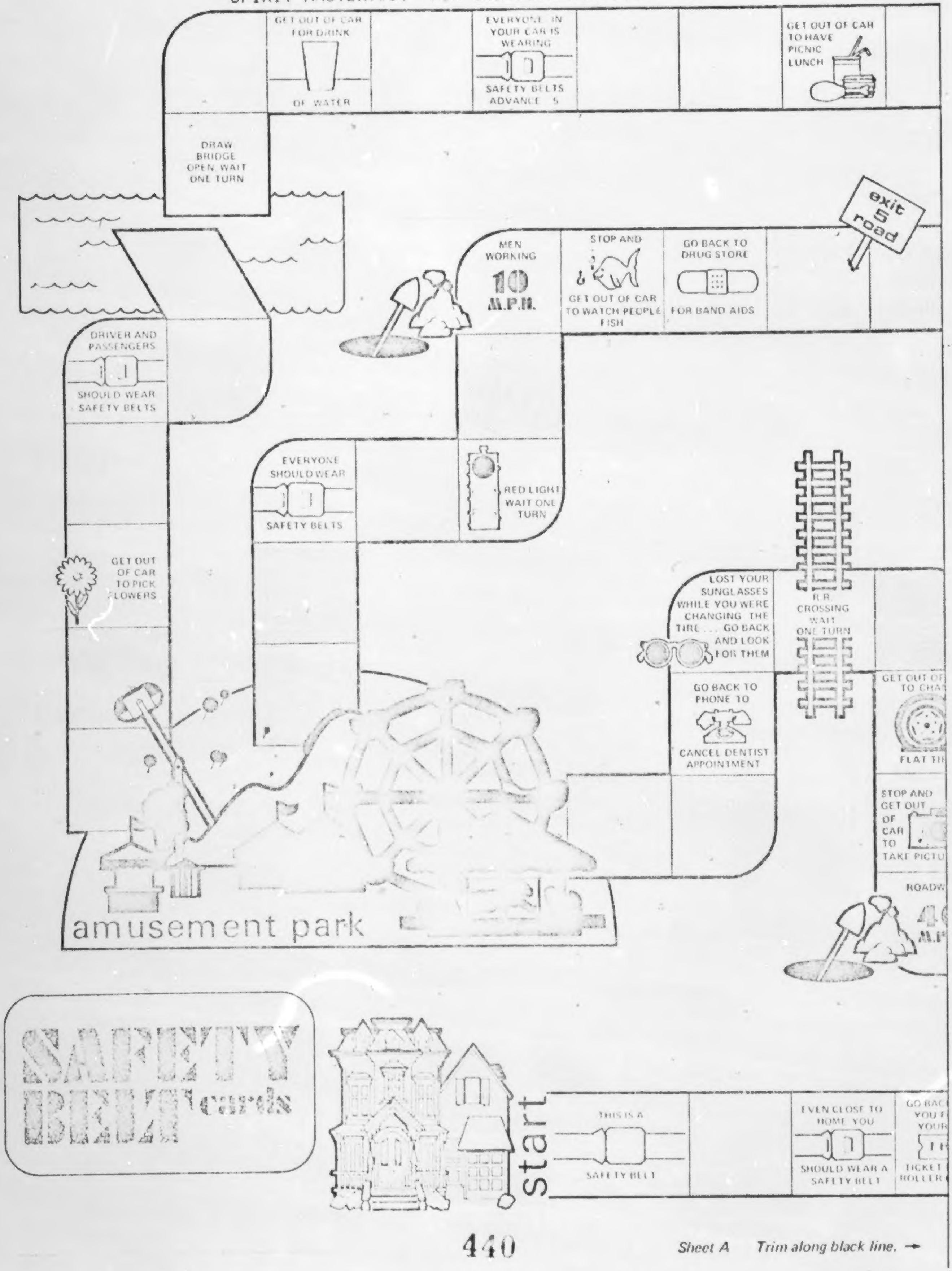
3 WHENEVER YOU LAND ON A SPACE THAT SAYS "GET OUT OF CAR" YOU MUST FASTEN YOUR SAFETY BELT BEFORE YOUR NEXT TURN YOU SHOW THE OTHER PLAYERS YOU'VE FASTENED YOUR SAFETY BELT BY TAKING A SAFETY BELT CARD IF YOU FORGET, YOU LOOSE YOUR TURN

4 THE PLAYER WHO GETS TO THE AMUSEMENT PARK FIRST WINS!

← *After trimming sheet A along the black line, line up the cut edge with this line and tape on the back.*

US Department of Transportation, National Highway Traffic Safety Administration

SPIRIT MASTER #5: FOR USE WITH ACITIVITY #19


GET OUT OF CAR FOR DRINK OF WATER
EVERYONE IN YOUR CAR IS WEARING SAFETY BELTS ADVANCE 5
GET OUT OF CAR TO HAVE PICNIC LUNCH
DRAW BRIDGE OPEN. WAIT ONE TURN
exit 5 road
MEN WORKING 10 M.P.H.
STOP AND GET OUT OF CAR TO WATCH PEOPLE FISH
GO BACK TO DRUG STORE FOR BAND AIDS
DRIVER AND PASSENGERS SHOULD WEAR SAFETY BELTS
EVERYONE SHOULD WEAR SAFETY BELTS
RED LIGHT WAIT ONE TURN
GET OUT OF CAR TO PICK FLOWERS
LOST YOUR SUNGLASSES WHILE YOU WERE CHANGING THE TIRE . . . GO BACK AND LOOK FOR THEM
R.R. CROSSING WAIT ONE TURN
GET OUT OF
TO CHA
FLAT TI
GO BACK TO PHONE TO CANCEL DENTIST APPOINTMENT
STOP AND GET OUT OF CAR TO TAKE PICTU
ROADW
4
M.P
amusement park
SAFETY BELT cards
start
THIS IS A SAFETY BELT
EVEN CLOSE TO HOME YOU SHOULD WEAR A SAFETY BELT
GO BAC
YOU F
YOUR
TICKET
ROLLER

Sheet A *Trim along black line.* →

SPIRIT MASTER #6: FOR USE WITH ACTIVITY #19

cut on black lines

		SAFETY BELT cards
SAFETY BELT cards	SAFETY BELT cards	SAFETY BELT cards
SAFETY BELT cards	SAFETY BELT cards	SAFETY BELT cards
SAFETY BELT cards	SAFETY BELT cards	SAFETY BELT cards
SAFETY BELT cards	SAFETY BELT cards	SAFETY BELT cards

Belts are worn just everywhere Even in planes that fly in the air.		
Here's a belt for you and me Now, how safe you'll be.	Accidents happen near and far So buckle the belts in your car.	If safety belts are always on You'll be safe as long as you're gone.
No matter where you are buckle-up in the car.	Safety belts should be worn by others, your mothers and father, your sisters and brothers.	Astronauts wear safety belts traveling very far Also, when they're in a car.
Whenever you go fast or slow Buckle-Up!	Safety belts are for kids like you And for Mommy and Daddy, too.	Men wear safety belts in a fast car race You should wear yours when you sit in your place.
Buckle safety belts on a trip – that's a very good tip.	When you leave the car just for a minute Buckle the belt when you're back in it.	To ride safe and sound wherever you go Fasten the belts on the way to and fro!

SPIRIT MASTER #7: FOR USE WITH ACTIVITY #19

SPIRIT MASTER #8: FOR USE WITH ACITIVITY #36

Questionnaire on Use of Public Transportation

1. How do you most frequently travel in the community?

   Car ____ Bus ____ Walk ____ Ferry ___ Train ___ Bicycle ___

   Taxi ____ Subway ____ Light Rail ____ None ____ Other ____

2. Why do you use this mode of transportation?

   Easy to use ____

   Economical ____

   Fast ____

   Fun ____

   No other way I can travel ____

   Other ____

3. Would you rather use some other mode of transportation than the one you are presently using? What would it be? Why?

   ____

   ____

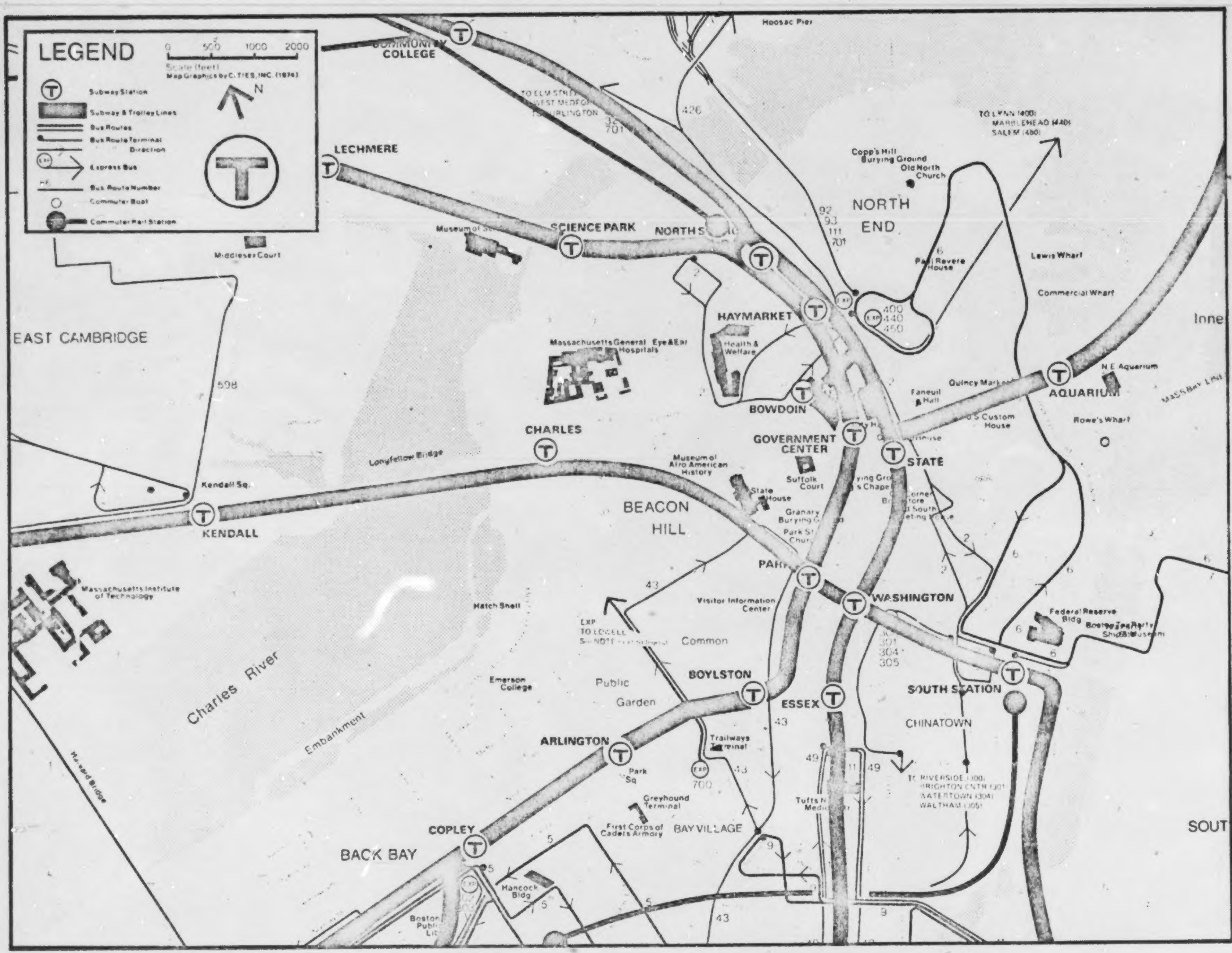
   ____

4. If there could only be one way to travel, what mode would you pick for everyone to use? Why?

   ____

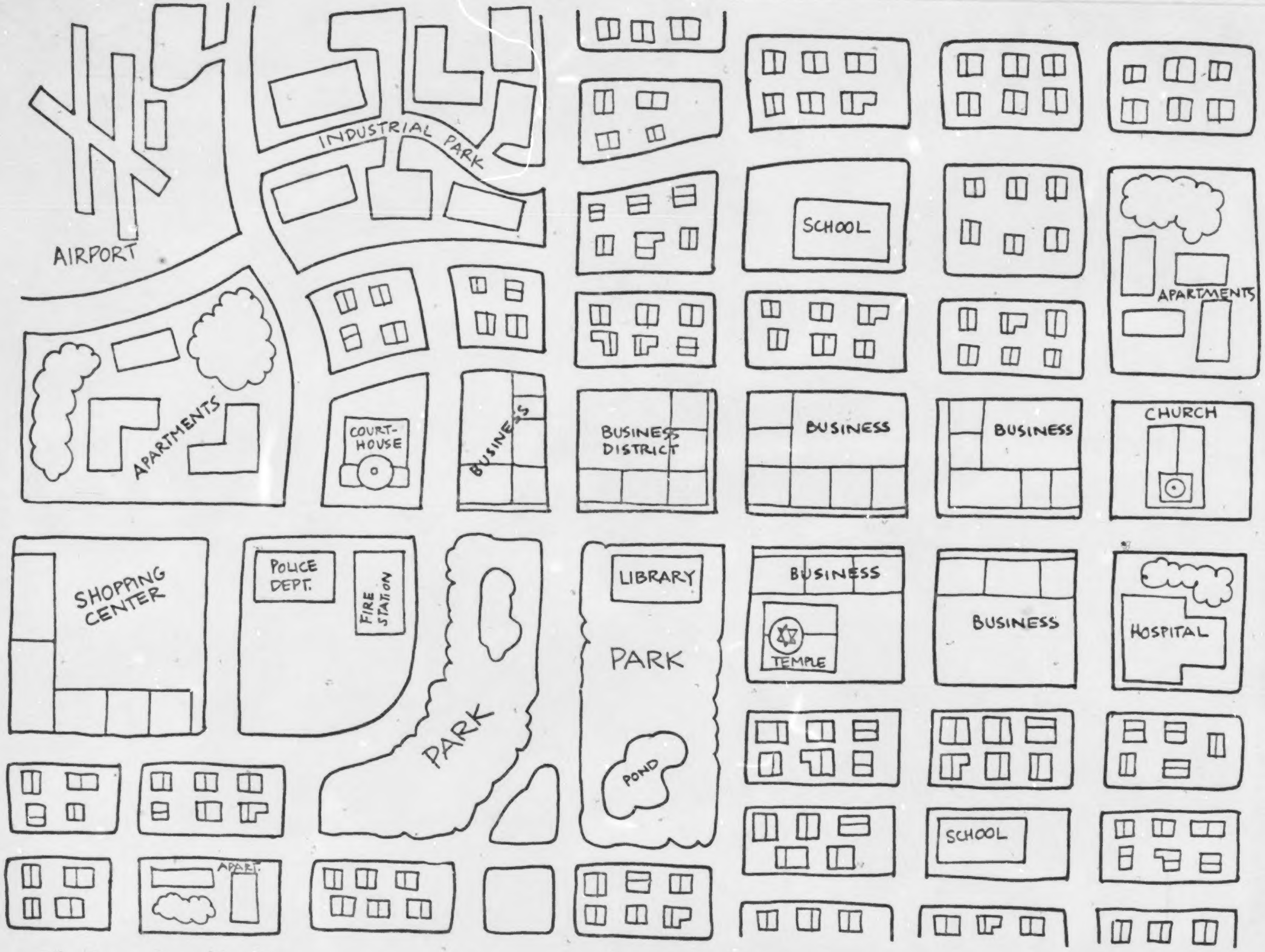
   ____

   ____


LEGEND
0 500 1000 2000
Scale (feet)
Map Graphics by C.I.T.I.E.S., INC. (1976)
N
Subway Station
Subway & Trolley Lines
Bus Routes
Bus Route Terminal
Direction
Express Bus
Bus Route Number
Commuter Boat
Commuter Rail Station
Hoosac Pier
COMMUNITY COLLEGE
TO ELM STREET
WEST MEDFORD
TO BURLINGTON
426
TO LYNN (400)
MARBLEHEAD (440)
SALEM (450)
LECHMERE
Copp's Hill Burying Ground
Old North Church
NORTH END
Museum of Science
SCIENCE PARK
NORTH STATION
92
93
111
701
Paul Revere House
Lewis Wharf
Middlesex Court
Commercial Wharf
HAYMARKET
400
440
450
EAST CAMBRIDGE
Massachusetts General Hospitals
Eye & Ear
Health & Welfare
Faneuil Hall
Quincy Market
N.E. Aquarium
AQUARIUM
698
BOWDOIN
U.S. Custom House
Rowe's Wharf
CHARLES
GOVERNMENT CENTER
STATE
Longfellow Bridge
Museum of Afro American History
Suffolk Court
State House
Kendall Sq.
KENDALL
BEACON HILL
Granary Burying Ground
Park St Church
PARK
WASHINGTON
43
Massachusetts Institute of Technology
Visitor Information Center
Hatch Shell
Federal Reserve Bldg
Boston Tea Party Ship & Museum
EXP TO LOWELL
Common
300
301
304
305
Charles River
Emerson College
Public Garden
BOYLSTON
ESSEX
SOUTH STATION
Embankment
CHINATOWN
ARLINGTON
Trailways Terminal
Park Sq
700
49
11
TO RIVERSIDE (300)
BRIGHTON CNTR (301)
WATERTOWN (304)
WALTHAM (305)
Greyhound Terminal
Tufts N.E. Medical Center
First Corps of Cadets Armory
BAY VILLAGE
COPLEY
BACK BAY
Harvard Bridge
Hancock Bldg
Boston Public Library
5
9
2
6
Inne
SOUT

SPIRIT MASTER #9: FOR USE WITH ACTIVITY #39

SPIRIT MASTER #10: FOR USE WITH ACTIVITY #44


AIRPORT
INDUSTRIAL PARK
APARTMENTS
COURT-HOUSE
BUSINESS
BUSINESS DISTRICT
SCHOOL
BUSINESS
BUSINESS
APARTMENTS
CHURCH
SHOPPING CENTER
POLICE DEPT.
FIRE STATION
PARK
LIBRARY
PARK
POND
BUSINESS
TEMPLE
BUSINESS
HOSPITAL
APART.
SCHOOL

3" of road = 1/4 mile

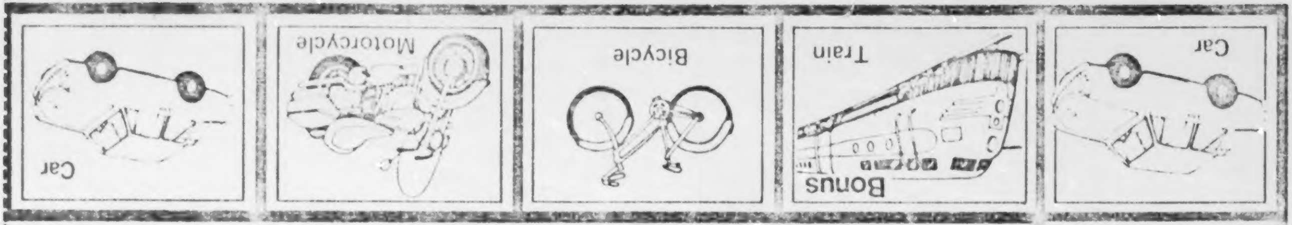
POLLUTION CHECKLIST

Each time you observe an example of transportation harming the environment put a checkmark in the box to the right of the example, under the appropriate date of the week.

Harmful Effect	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*	*Sunday*	*Comments*
1. Loud airplane noises								
2. Loud car noises								
3. Loud bus and truck noises								
4. Unpleasant car smells								
5. Unpleasant truck and bus smells.								
6. Oily water								
7. Ugly roadside								
(a) Billboards								
(b) Gas stations								
(c) Parking lots								
(d) Litter								
(e) Car "graveyards"								
(f)								
(g)								
8. Traffic jams								
9.								
10.								

SPIRIT MASTER #11: FOR USE WITH ACTIVITY #52

SPIRIT MASTER #12: FOR USE WITH ACTIVITY #58



Rules:

1. Each player receives 15 cards and selects a playing piece.

2. Roll die to determine first player; move clockwise in turn after that.

3. Throw die to find out number of boxes to move.

4. Each box represents a vehicle or a way to travel that could or does have good or bad effects on the environment.

5. When it is your turn, throw the die and move the proper number of spaces. If you land on an uncovered square, place on that square one of your cards that describes a possible effect the vehicle in the square could have on the environment.

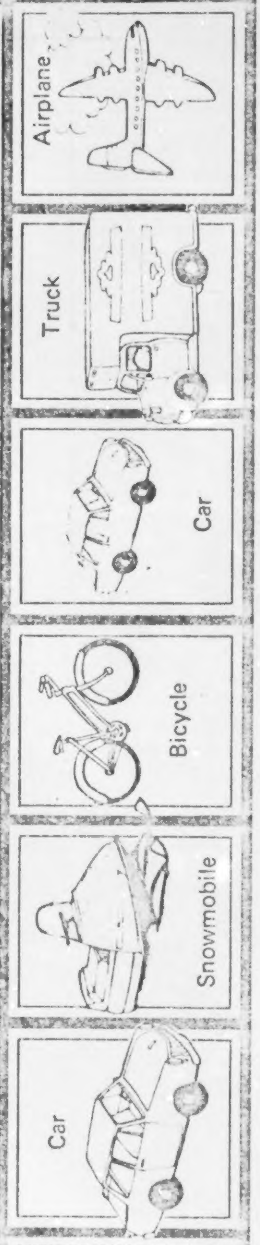
6. If you land on a box already covered by a card, better luck next turn! Next player moves.

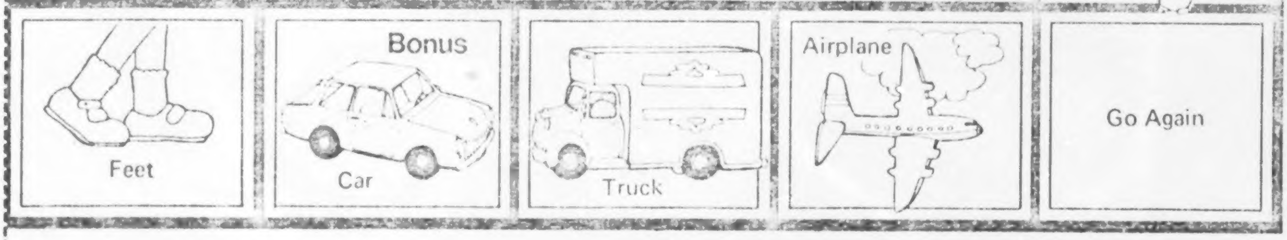
7. If you land on a box for which you have no appropriate card, better luck next turn! Next player moves.

8. Players may get rid of any one card each time they pass START.

9. Challenges: If you think another player has laid down an incorrect card, you may challenge. If you're right, you get to lay down the right card. He removes his. If you're wrong, original player gives you one of his cards. Check with your teacher to see who is correct in a challenge.

Winner: Player who uses up all his cards first, or has fewest left at the end of the game, is the winner.

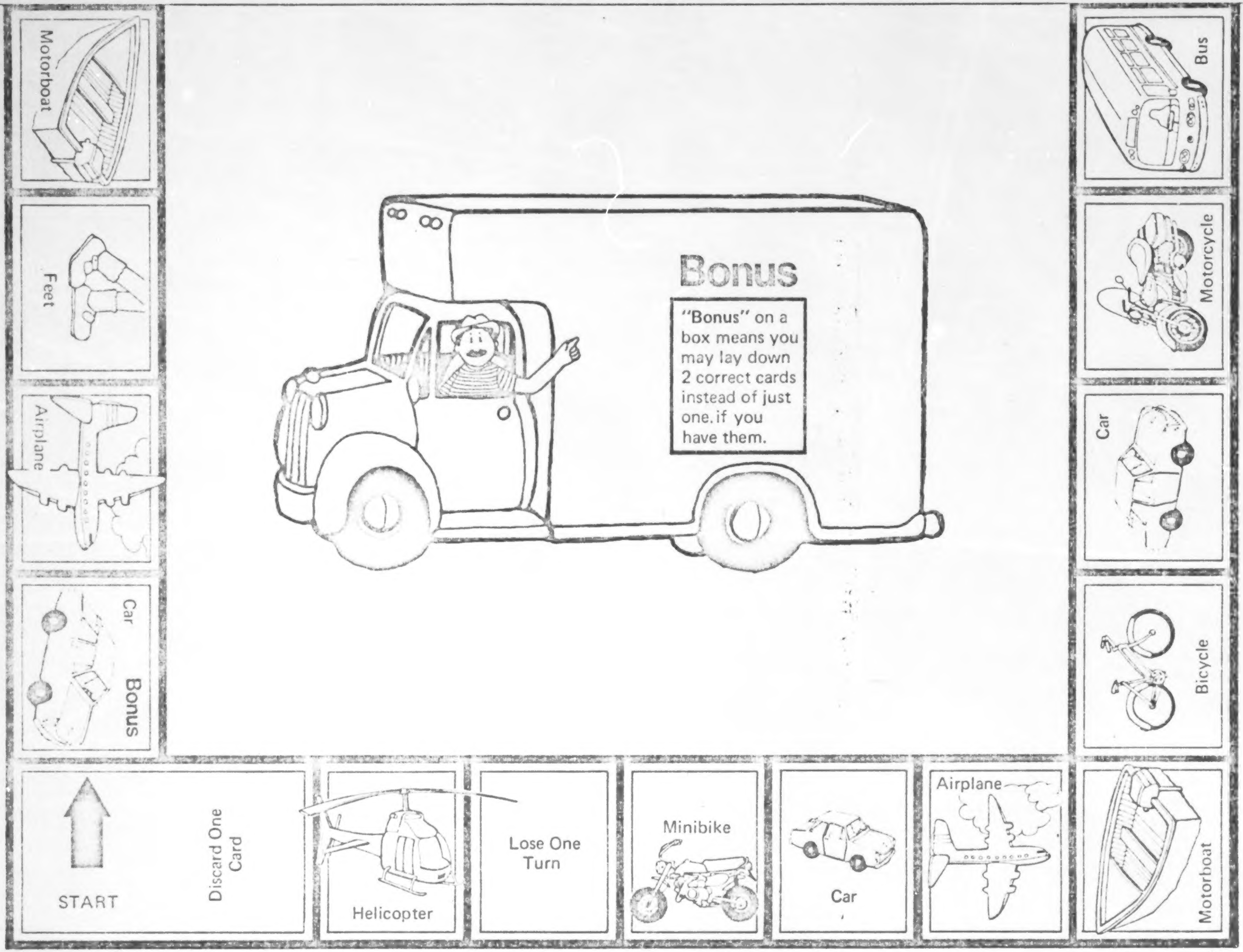




←Trim along dotted line.

Sheet A

SPIRIT MASTER #13: FOR USE WITH ACTIVITY #58


Motorboat
Feet
Airplane
Car
Bonus
START
Discard One Card
Helicopter
Lose One Turn
Minibike
Car
Airplane
Motorboat
Bicycle
Car
Motorcycle
Bus

Bonus

"**Bonus**" on a box means you may lay down 2 correct cards instead of just one, if you have them.

After trimming sheet A along the dotted line, line the cut edge up with this line and tape on the back. →

SPIRIT MASTER #14:
FOR USE WITH
ACITIVITY #58

PLAYER 1			PLAYER 2			PLAYER 3		
Lung Problems	Can Cause Ugly Scenery	Helps Fight Fires	Lung Problems	Can Cause Ugly Scenery	Helps Fight Fires	Lung Problems	Can Cause Ugly Scenery	Helps Fight Fires
Helps You Have Fun	Delivers Food	Causes Difficulty Sleeping	Helps You Have Fun	Delivers Food	Causes Difficulty Sleeping	Helps You Have Fun	Delivers Food	Causes Difficulty Sleeping
Gives You a Chance to See Scenery	Crop Spraying	Can Cause Difficulty Hearing Radio and TV	Gives You a Chance to See Scenery	Crop Spraying	Can Cause Difficulty Hearing Radio and TV	Gives You a Chance to See Scenery	Crop Spraying	Can Cause Difficulty Hearing Radio and TV
Can Cause Dirty Water from Oil Spills	Can Use Up Parks and Playgrounds	Can Cause Dirty Laundry on the Clothesline	Can Cause Dirty Water from Oil Spills	Can Use Up Parks and Playgrounds	Can Cause Dirty Laundry on the Clothesline	Can Cause Dirty Water from Oil Spills	Can Use Up Parks and Playgrounds	Can Cause Dirty Laundry on the Clothesline
Can Force People to Move	Has No Bad Effects	Plants Seeds	Can Force People to Move	Has No Bad Effects	Plants Seeds	Can Force People to Move	Has No Bad Effects	Plants Seeds